THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES NO. 194, 23:1–34.

STUDIES OF JUPITER'S EQUATORIAL THERMAL LIMB DARKENING DURING THE 1965 APPARITION

ROBERT L. WILDEY AND LAURENCE M. TRAFTON
U.S. Geological Survey, Flagstaff, Arizona, and McDonald Observatory,
University of Texas, Austin, Texas
Received 1970 July 24; revised 1970 September 10

ABSTRACT

Refinements in the statistical analysis underlying a determination of the average observational limb darkening, and in the quasi-static model-atmospheric determination of theoretical limb darkening, are presented for Jupiter. Photometric scans totaling forty-one are used. An account of the effects of ammonia on temperature structure (back warming), as well as the integrated equation of transfer determining specific intensity (blocking), is incorporated into the theory. The theoretical monochromatic brightness is weighted by the 8–14-μ spectral response of the photometer (which affords observational comparison) and by atmospheric transmission. The theoretical limb darkening has then been convolved with smear functions due to the astronomical seeing and finite instrumental aperture. The resulting effective temperature is between 135° and 140° K, values which agree satisfactorily with the direct bolometric measurement and which confirm the existence of an internal Jovian heat source larger than the absorbed solar radiation. The helium-to-hydrogen ratio is not a strong influence on the comparison.

I. INTRODUCTION

The temperature in Jupiter's stratosphere lies below the freezing point of NH_3 so that NH_3 vapor is likely to be in equilibrium with the solid ammonia. In this circumstance, the partial pressure of NH_3, and consequently the NH_3 absorption, varies exponentially with the local temperature. Since the stratospheric temperature is proportional to the planet's effective temperature, Jupiter's limb darkening in the spectral region of the 10-μ band of NH_3 provides a sensitive observational indication of the planet's effective temperature (Trafton 1967). Further support for this simple view of the ammonia concentration in the Jovian upper atmosphere arises from the fact that thermal mapping of Jupiter in the 10-μ band of NH_3 on many separate occasions reveals picture contrasts highly subdued, sometimes undetectable beyond simple limb darkening, compared with the picture presented in reflected sunlight (Wildey 1968). Profound anomalies appear to be infrequent. The year-to-year variation in 10-μ brightness temperature as measured during the last decade has been less than 2° K.

A preliminary derivation of Jupiter's equatorial effective temperature for the 1965 opposition was carried out by Trafton and Wildey (1969, 1970) by comparing the observed limb darkening in the 8–14-μ region with theoretical limb-darkening curves. We have since improved the models by taking into better account the effect of the NH_3 rotational band on the Jovian temperature structure. In this paper we present the results of this analysis.

II. THE THEORETICAL LIMB-DARKENING CURVES

The model atmospheres employed are modifications of nongray models in which hydrostatic and local thermodynamic equilibrium prevail, together with radiative equilibrium above the ammonia-lifting condensation level and convective equilibrium below (Trafton 1967). The models originally take into account the influence of the continuous opacity of He-H_2 mixture on temperature structure. In the present study the rotational NH_3 band has been added to the equation imposing flux constancy. A scheme for incorporating the 10- and 16-μ vibration-rotation bands of NH_3 into the equation of radiative transfer has also been introduced. We assume that NH_3 is saturated down to a level where its vapor pressure equals 6.7×10^{-4} times the total pressure and that the NH_3 mixing ratio is constant below this level. The exception is the strong 10-μ band of NH_3, which we treat, with little error, as being saturated at all levels. We also assume that no particle scattering contributes significantly to the extinction either in the 8–14-μ spectral region or in other parts of the thermal spectrum. Furthermore, we neglect the absorption in the tail of the 7.5-μ CH_4 band in the observed bandpass.

The continuous thermal opacity of the hydrogen-helium mixture is due to transitions in the field interactions of the molecules, both in translation relative to mutual potential wells and in changes of rotational orientation of pressure-indiced dipoles with respect to the average intermolecular potential. These are pure absorption processes compared with which Rayleigh scattering and Raman scattering are negligible at thermal wavelengths. This opacity is sufficient to cause the emergent infrared thermal radiation to originate in a depth range all of which is some tens of kilometers above the visible cloud structure, as would be demanded by the much lower brightness temperatures at thermal wavelengths compared with spectroscopically derived temperatures characteristic of the cloud species absorbing sunlight (Trafton 1967; Wildey 1968). The rationale of employing constant-flux atmospheric models rests on the reasonability of the assumption that sunlight is negligibly absorbed until it is in the vicinity of the clouds. Although solar ultraviolet is scattered at higher levels, there is not yet convincing evidence that it is absorbed. So high above the clouds the possibility seems relatively remote that a Mie-scattering coefficient may be significant at thermal wavelengths compared with absorption. However, studies of multicolor imagery and polarization reveal the presence of at least a mild haze in this general region. If ammonia vapor is in equilibrium with the solid, one might expect such a haze on theoretical grounds alone. Whether such a haze significantly affects Jupiter's thermal limb darkening is not presently known, and this must be regarded as a fundamental limitation of the present study.

We employ Gille and Lee's (1969) random exponential band model for NH_3 to describe the rotational NH_3 band absorption in the Jovian model atmospheres. The effective mean rotational NH_3 absorption coefficient in the limit of small line-width to line-spacing ratio α/δ is (Trafton 1970)

$$K'(j) = \frac{2\alpha}{N_j\delta}\left\{\sum_i^{N_j}[\langle k_\nu(i)\rangle]^{1/2}\right\}^2 ,$$

where $k_\nu(i)$ is the monochromatic absorption coefficient for the ith line. This mean is a local average over a frequency interval just small enough so that B_ν does not vary significantly over this interval but large enough to smooth the rapid frequency variation of the NH_3 band. It varies slowly with frequency interval j. Its use greatly reduces the calculations required in constructing a nongray model and is justified by the *a posteriori* observation that $dB_\nu/d\tau_s$ is linear in this absorption coefficient over the rotational band, where τ_s is the standard optical depth.

To test the effect of the rotational NH_3 band on the limb darkening, we computed profiles from model atmospheres alternately containing and not containing this band. Figure 1 illustrates the comparison for the $T_e = 140°$ K and $He/H_2 = 0$ model. The difference is even less for the $He/H_2 = 1$ models because the stronger translational absorption in this case more effectively masks the rotational NH_3 band. These comparisons indicate that the approximations in our treatment of the rotational NH_3 band absorption do not significantly affect the results.

The effect of the 10- and 16-μ vibration-rotation bands on the 8–14-μ emergent specific intensity was incorporated into the theory as follows.

The high-resolution transmission data from Garing, Nielson, and Rao (1959) and Mould, Price, and Wilkinson (1959) have been used to construct, line by line (where possible), a model of the 10- and 16-μ bands of NH_3. A microscope-projector was used to

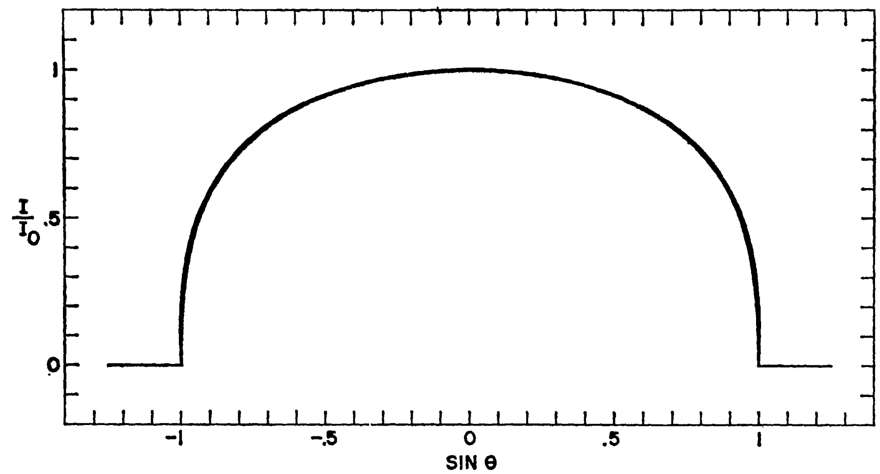


FIG. 1.—The influence of NH_3 on 10-μ limb darkening with respect only to its modification of the temperature structure upon being incorporated into the equations of radiative equilibrium. Given the temperature structure in each case, the NH_3 monochromatic absorption is included in both integrations of the equation of transfer producing the two limb-darkening curves. Model parameters are $T_e = 140°$ K and $He/H_2 = 0$. Resolution is infinite.

enlarge the published spectra and measure the equivalent width and wavenumber of each line. Line symmetry was used to decide how to partition the equivalent widths in blends. Next we derived the line strengths for each line assuming Lorentz profiles and the Ladenburg-Reiche (1913) theory of the curve of growth (see also the review by Goody 1964). The two sets of data helped to resolve any ambiguities as to whether a line was saturated or on the linear part of the curve of growth. Most of the data on the 10-μ band were saturated.

Realizing that most of the radiation would pass through the far wings of the line and not near the line centers which are fairly Lorentzian, we adopted a line whose core was Lorentzian but whose wings varied as an arbitrary power of the frequency displacement from the line center.

A band model for room temperature was constructed for more than 505 lines. The equivalent width of this band between 660 and 1300 cm^{-1} for a number of pressures, path lengths, and line-shape parameters was computed. We assumed that all the lines had the same half-width. This is not true, but the value of the half-widths does not sensitively affect the computed equivalent widths. Spectral resolution is insufficient to permit direct determination of the half-widths, and therefore some value must be assumed. The value is related to the normalization of the line strengths since they are derived simultaneously from the laboratory data.

Next, we fitted these band models to the low-resolution data of France and Williams (1966), who made extensive measurements of the equivalent width of the band from 660 to 1300 cm^{-1} over a very large range of both pressure and path length. Unfortunately, the measurements were all at room temperature and not at Jovian temperature. It was found impossible to match the observed and calculated bands when Lorentz profiles were assumed. On the other hand, a very good match was obtained over the entire domain of pressure and path length when the wings of the line profiles varied according to a different exponent (1.78). This line shape for the band model was adopted.

In the Jovian atmosphere, NH_3 self-broadening is negligible. The pressure-broadening coefficients for NH_3 in a mixture of H_2 and He are unknown for the 10-μ band of NH_3, so we assume that they are essentially the same as those for the microwave lines of NH_3 (Legan *et al.* 1965). These room-temperature data are known to within 5 percent accuracy. That we obtain a good fit for our semiempirical model of the 10- and 16-μ bands of NH_3 to both the high-resolution and the low-resolution laboratory data using a single line width indicates that the distribution of line widths in the band does not effect the mean transmission visibly. When α/δ is small, the mean transmission deviates significantly from unity only after the individual lines have become saturated, so the limb darkening does not depend sensitively on the line shape or width in the core.

The line shape in the wings was derived from pure NH_3 or NH_3-N_2 mixtures and may be different for mixtures of NH_3 with H_2 and He. We assume that the error arising from this uncertainty has only a secondary effect on the determination of the effective temperature.

The band model was made to represent Jovian temperatures by altering the Boltzmann factors and partition function of the bands. A temperature of 130° K was assumed, except near the short-wavelength wing of the band where a mean temperature of 180° K was used. This rendered the 16-μ band nearly insignificant, as well as many of the lines in the 10-μ band.

Assumptions after Townes and Schawlow (1955) were made regarding the theoretical dependence of collisional half-width on temperature. The local temperature was then used to evaluate this half-width.

Using a frequency grid fine enough to delineate the frequency dependence of the band model, even at low pressures, we calculated mean transmissions over intervals of 10 cm^{-1} throughout the 8–14-μ region for isothermal and isobaric paths. Tables of these mean transmissions were generated for a grid of effective pressures and path lengths. The effective pressure depended on the local temperature as well as on the partial pressures of the broadening gasses.

The Curtis-Godson approximation (Curtis 1952; Godson 1953) was generalized to apply to the new line shape. This, of course, required that the mean transmission along a homogeneous path agree with that along a path for which both the pressure and temperature varied, both in the strong-band and weak-band limits. "Effective" line parameters described the band model for the equivalent homogeneous path. The expressions for the equivalent pressure P_e and equivalent absorber A_e corresponding to a homogeneous atmosphere are

$$(P_e)^{0.78} = (\int dA_e P^{0.66})/(\int dA_e P^{-0.12}) \,, \qquad A_e = \int dA \,,$$

where P is the local "NH_3 equivalent pressure" and where we have neglected the variation of the mean line strength with depth and the line-to-line variation of the half-width.

Because the 10- and 16-μ bands of NH_3 lie on the tail of the thermal spectrum, they do not significantly affect Jupiter's temperature structure. Consequently, we added these bands to the models only after the structure had been determined by using the pressure-induced He-H_2 opacities and the rotational NH_3 band.

At each level of the model, the modified Curtis-Godson approximation was used to find what homogeneous path was equivalent to the actual path between a given depth in a specific model and the surface in a specific direction. These effective pressures and path lengths were calculated for each depth of each model. The appropriate value for the particular cos θ (angle of specific intensity with local vertical) under consideration was interpolated in the table of mean transmission. Accordingly, the following modified integrated equation of transfer was used:

$$I_\nu(\mu, 0) = \int_0^\infty B_\nu(T) \exp\left[\frac{-\tau_\nu(H_2 + He)}{\mu}\right] T_\nu(NH_3) \frac{d\tau_\nu}{\mu} \,,$$

where the frequency-dependent quantities are averages over intervals of 10 cm^{-1}, the integration is over all the layers of the model shallower than total $\tau_\nu = 12$, $\tau_\nu(H_2 + He)$ is the monochromatic optical depth of the helium and hydrogen opacities, and $T_\nu(NH_3)$ is the mean transmission of NH_3 at wavenumber ν and along path $\mu = \cos\theta$.

As has been stated earlier, the NH_3 in Jupiter's atmosphere has a negligible effect on the planet's temperature structure, except for the higher-temperature models where the effect is small and arises from the rotational band rather than the 8–14-μ vibration-rotation bands. Nevertheless, the observational bandpass encompasses a small fraction of Jupiter's thermal spectrum, and therein NH_3 dominates the average absorption coefficient in comparison with H_2-He. It has been said that the 8–14-μ bands are saturated in Jupiter's spectrum. Ordinarily, for a constant-flux LTE atmosphere, such a statement implies that the monochromatic brightness temperature over the wavelength interval observed is equivalent to the boundary temperature of the model atmosphere. Such a temperature (approximately 100° K) is certainly lower than that observed (129° K). This is due to the fact that the H_2-He opacity is effective at much higher atmospheric levels due to the strong concentration of NH_3 near the cloud tops imposed by its vapor-pressure equilibrium with the solid phase. The meaning of saturation is thus that within the bands the flux between line cores rises very little. If we make the usual approximation that the mean optical depth of continuum formation is 0.6, crudely corresponding to a depth of 45–50 km below the top of the Jovian photosphere (or roughly 20 km above cloud-temperature level) according to model selections we will make in the next section of this paper, then the average level from which the 8–14-μ flux emerges is approximately 2 km higher than this. At this level the H_2-He absorption coefficient is below that of NH_3 in the same wavelength range by almost an order of magnitude. The depth-integrated contribution functions of the two molecular groups become more nearly equal, however, with NH_3 retaining dominance. It is easily appreciated that the confinements of NH_3 to a narrower depth range than H_2-He thus causes it to flatten the limb darkening of Jupiter over what the planet would exhibit with an atmosphere of only H_2 and He. It is also of interest that the confinement of the effects of NH_3 to regions blanketed by absorbing H_2-He, in which negligible NH_3 is present, promotes the adequacy of the approximation methods used to determine the effect of NH_3 on temperature structure. The smallness of the effect is nevertheless the best guarantor of this adequacy.

III. THE OBSERVATIONAL LIMB DARKENING

The observational limb darkening of Jupiter was obtained by making infrared scans across an approximate Jovian diameter. The 200-inch Hale telescope of Palomar Observatory was used. The scans (totaling 41) were collected on various dates throughout the 1965 apparition, as shown in Table 1. As equatorial-diametric scans, they are estimated to have passed within about 5°, or possibly 10°, of Jovidetic arc of Jupiter's sub-Earth point, and the angle of the scan line with the projected Jovian pole varied from about 73° to 77°. The scan direction was actually in right ascension at the rate of +2500 arc sec hour^{-1}. A mercury-doped germanium photoconductor cooled with liquid hydrogen was used. Aspects of the technique and photometric system have been previously reported (Wildey 1966*a*, 1968).

TABLE 1

THE OBSERVATIONS

Julian Day (2438000+)	Number of Scans	Jovian Equatorial Diameter	Axial Position Angle
789.58	14	41″13	343°
812.60	5	38″19	343°
805.59	8	39″04	343°
867.63	4	33″60	347°
834.61	3	35″91	345°
824.61	7	36″87	344°

Each scan was first standardized as to the sin θ scale (*abscissa*). This was not done in an absolute sense since an observational limb darkening does not go to zero at sin $\theta = \pm 1$, and no astrometric calibration of scan rate was available with which a physical ephemeris (semidiameter) might have provided such a calibration. Forty points were chosen evenly along the abscissa where the ordinate (infrared specific intensity) was evaluated. This division satisfied the Nyquist criterion fairly well. Points 0 and 40 were placed at the extrapolated intersection of the limb signal with the sky and background, and the ordinate was defined zero at 0 and 40. Next, in order to weigh all points of a scan evenly in the intercomparison of scans, and to avoid undue biasing of the atmospheric-extinction analysis by the random error and atmospheric-extinction fluctuation of the center point of each scan, the ordinate was scaled by normalizing the area under each scan to unit value. Thus the atmospheric extinction correction to first order in sec z (zenith angle) was automatically incorporated in this normalization.

From this point on in the analysis, the measured scan ordinates at each value of the scan abscissa were treated as statistically independent and were analyzed separately.

At each point of the abscissa, then, the following analysis was performed. The ordinate points were replaced by their logarithms as a newly defined and superseding ordinate. The mean value of the ordinate was computed. The difference between individual ordinate values and the mean ordinate was fitted to a second-degree polynomial in sec z. A perfectly gray extinction across the 8–14-μ band, or a lack of dependence of the relative Jovian infrared spectrum on limb distance, would result in zero coefficients for both first- and second-order terms in sec z (in fact, rigorous independence of scan shape on sec z). The residuals between the individual ordinates as reduced observations and the ordinates as predicted by the polynomial were determined. Those observations were thrown out for which the residual was greater than 2.5 times the average residual. The analysis was performed anew on the revised data set. This process was repeated until none of the observations were rejected. Thus it was possible to select different sets of scans from which the final ordinates at different abscissae would be determined. The results are summarized in Table 2. In the extremes producing the final result all forty-one observa-

TABLE 2

SYNTHESIS OF OBSERVED LIMB DARKENING

Abscissa Point	Scans Used	Number of Iterations to Stabilize	Abscissa Point	Scans Used	Number of Iterations to Stabilize
1.	38	1	21	36	2
2.	34	4	22	35	3
3.	34	3	23	36	3
4.	30	5	24	37	2
5.	34	4	25	37	2
6.	41	0	26	37	2
7.	38	2	27	38	2
8.	30	5	28	38	1
9.	35	2	29	40	1
10.	29	6	30	40	1
11.	39	1	31	41	0
12.	38	3	32	40	1
13.	36	3	33	37	2
14.	36	3	34	32	6
15.	35	4	35	34	4
16.	32	5	36	41	0
17.	32	5	37	38	2
18.	34	4	38	33	3
19.	36	3	39	36	2
20.	33	4			

tions were retained at three points of the abscissa while at one point only twenty-nine observations were retained. With the final set of thirty-eight polynomials, the limb darkening was computed at sec $z = 1$. This result differed negligibly from the limb darkening associated with the average at each abscissa point of ordinates of the corresponding data set. Thus no real dependence of scan shape on sec z was found. The ordinate was finally converted back to an antilogarithmic scale.

In the course of evaluating the data, the high-spatial-frequency features of individual scans (except those obviously much higher than the optical transfer function of the photometer extends) have been honored without adjudication of physical reality in the individual case. The signal-to-noise ratio of a single independent scan is not generally sufficient for this unless such sharp anomalies are of high amplitude. As a consequence of the statistical analysis employed, features present on only a few scans are rejected, whether they are real or only artifacts of noise. In view of the large number of scans involved, any sharp feature or limb-darkening asymmetry which emerges in the final result must be reasonably considered an aspect of Jovian "steady state" insofar as such a condition can be given meaningful existence. The formal probable error of every point on the final limb-darkening curve is considerably under 1 percent, and definitely smaller than the degree of limb-darkening asymmetry.

In Figure 2 may be seen all of the individual scans incorporated into the present study. Although there are many scans where response to band structure is obvious (this aspect of the Jovian infrared emission has been previously discussed [Wildey 1968]), there is no obvious bias leading to the emphasis of a particular feature in the overall synthesis. However, it may well be noted that in the statistical analysis as shown in Table 2, the

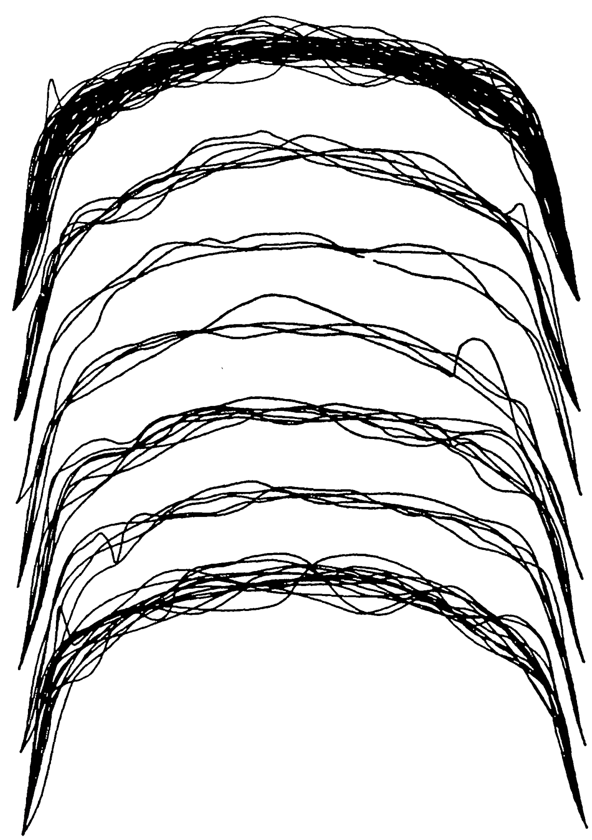


FIG. 2.—All normalized observational limb-darkening curves prior to statistical analysis. They are shown separated by observing run; at the top may be seen a plot of all of the scans against the same ordinate. The ascending order of the rest of the curve sets corresponds to the ordering in Table 1.

number of individual observations rejected on the morning side is sixty-seven whereas there were only thirty-nine rejections on the afternoon side.

IV. COMPARISON OF THEORY AND OBSERVATION

In order to obtain a theoretical comparison with the observational limb darkening it was first necessary to weigh the emergent monochromatic specific intensity by the spectral responsivity of the photometer and the atmospheric transmission and then to map it as a function of sin θ. The results were the same whether the atmospheric transmission used was that of Sinton and Strong (1960) or that of Goetz (1967). The equation of transfer was integrated over depth at ten values of cos θ. Linear interpolation was found to be quite adequate in transforming I_ν from μ to sin θ between all points of the model output except between $\mu = 0$ and $\mu = 0.02$ ($\mu = \cos\theta$). In this region it was considered that the interpolation formula should fit both the value and the slope of the $I(\mu)$ output curve at $\mu = 0.02$, and furthermore the value of the interpolation formula should be zero at $\mu = 0$ whereas its first derivative should approach infinity as $\mu \to 0$. A convenient formula found to possess these properties with no points of inflection in the region of use, was

$$f(x) = AX^{-1/B} ,$$

where

$$B = 4I(\mu = 0.02)/[I(\mu = 0.1) - I(\mu = 0.0)] \quad \text{and} \quad A = I(\mu = 0.02)(0.02)^{-1/B} .$$

The efficacy of the formula was verified by integrating the transfer equation for $\mu = 0.01$.

The overall atmospheric-instrumental convolution function was determined as a tabulated function by numerically folding the Gaussian profile of atmospheric seeing with the semielliptical profile of the circular photometer aperture as follows. The relationship between the observed limb darkening and the true limb darkening, of infinite resolution, may be represented as two convolutions of the true profile performed in sequence by the seeing smear function and the photometer smear function. The actual diffraction of the 200-inch telescope, which is of course not of Gaussian profile, and which is 0''.7 at 10 μ on the Rayleigh criterion, is assumed incorporable into seeing with little error. Thus we have

$$\Phi(\nu'') = \int_{-\infty}^{\infty}\int_{-\infty}^{\infty} \phi(\nu)\Lambda_s(\nu - \nu')\Lambda_p(\nu' - \nu'')d\nu d\nu' ,$$

where

$$\Lambda_s(\chi) = \exp(-\tfrac{1}{2}\chi^2/\sigma^2) ;$$
$$\Lambda_p(\chi) = (a^2 - \chi^2)^{1/2} , \qquad -a < \chi < a ;$$
$$\Lambda_p(\chi) = 0 , \qquad |\chi| > a ,$$

which is reducible to

$$\Phi(\nu') = \int_{-\infty}^{\infty} \phi(\nu' - \nu)\Lambda_\tau(\nu)d\nu ,$$

where

$$\Lambda_\tau(\nu) = \int_{-a}^{a} (a^2 - \chi^2)^{1/2} \exp[-(\nu - \chi)^2/2\sigma^2]d\chi .$$

Units are sin θ. The function $\Phi(x)$ is observed limb darkening and $\phi(x)$ is true limb darkening. If one uses a mean Jovian equatorial semidiameter, weighted by number of scans, of 19''.26, the value of a is 0.07915. The value of σ is taken to be implied by a visual estimate of the seeing on the Mount Wilson scale and a size of seeing-tremor-disk corresponding to a Gaussian threshold of 10 percent of peak value. Inasmuch as the seeing smear is somewhat inexact, each model has been treated for several values of seeing.

The smeared theoretical limb darkening was then computed at fifty points in sin θ from -1.25 to $+1.25$ by numerically folding the (infinitely resolved) theoretical limb-darkening curve with the overall atmospheric-instrumental profile corresponding to the "seeing" used in the individual computation. The curve was then normalized to $I(0) = 1$.

For comparison between theory and observation the analyzed observational limb-darkening curve was now normalized to a central value of unity, and its abscissa was calibrated in terms of sin θ by requiring the areas under the observational curve and the smeared theoretical curve to be equal. The complete results of this study are tabulated in Table 3.

V. DISCUSSION

The tabulation shows that the effect of varying the He/H_2 ratio on the theoretical limb-darkening curves is small compared with the effect of varying the effective temperature. In principle, we could derive He/H_2 from the magnitude of the specific intensity once we know T_e from the normalized limb darkening. We could not accomplish this because the neglect of the 7.5-μ bands of CH_4 alters the flux in the 8–14-μ range by nearly 20 percent. Whereas this neglect precludes a determination of the He/H_2 ratio, it affects the brightness temperature by less than 2° K and the limb darkening is scarcely affected at all so that it does not interfere significantly with our T_e determination.

The best fits imply an effective temperature for Jupiter's equatorial region between 135° and 140° K, with perhaps slight preference for the latter figure. This judgment ignores the disturbance (*sharp shoulder*) near the eastern limb which, if taken into account, would raise the value of the effective temperature closer to that found in our preliminary report but would result in a worse overall fit. In Figure 3 the observational-theoretical comparison of limb darkening is shown for the case $T_e = 135°$ K, $He/H_2 = 1$, and seeing = 3. Figures 4–6 show the comparison for variation of model parameters in the neighborhood of best fit. In Figure 7, the comparisons that are shown are for the same model parameters as Figure 3; however, all values of seeing (quite in excess of seeing uncertainty) plus perfect resolution are incorporated. The seeing effects are surprisingly small except immediately near the limb. The general disagreement between theory and observation almost exactly at the limb surely arises from the inadequacy of a Gaussian representation of seeing in the wings of the resulting smear. That the fit for other values of the effective temperature is significantly worse may be readily verified by plotting values from Table 3. There is slight indication that the fits may be better for seeing 4 than seeing 3. That the seeing at 10 μ is better than that in the visual range is reasonable, but by what amount is difficult to ascertain. The use of the seeing 4 comparisons may thus be justified even though seeing 3 was selected as nominal even with a subjective allowance for the wavelength difference. The comparisons seem uniformly improved, so that the same T_c is redeemed. It may be mentioned in passing that inas-

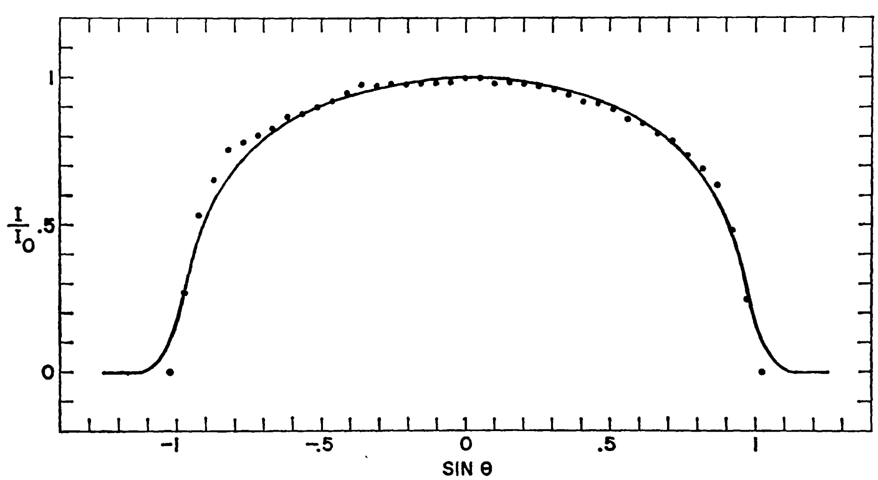


FIG. 3.—Observational-theoretical comparison of Jovian 10-μ limb darkening for $T_e = 135°$, $He/H_2 = 1$, and nominal infrared seeing. *Filled circles*, observations.

TABLE 3

Jovian Limb Darkening

		THEORETICAL LIMB DARKENING				
I	SINE(THETA)	WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000137	0.00033790
11	-1.14999866	0.0	0.0	0.00000000	0.00016991	0.00341657
16	-1.09999847	0.0	0.00000000	0.00003653	0.00467813	0.01844197
21	-1.04999924	0.0	0.01750612	0.02005006	0.03810162	0.06356603
26	-0.99999928	0.0	0.11684066	0.11848080	0.13160366	0.15166068
31	-0.94999933	0.30781758	0.27468961	0.27472568	0.27351248	0.27370989
36	-0.89999932	0.43592864	0.42490798	0.42363065	0.41302949	0.40016210
41	-0.84999931	0.53032374	0.52411509	0.52358431	0.51851743	0.50744355
46	-0.79999930	0.60593945	0.60161936	0.60129887	0.59840661	0.59177840
51	-0.74999928	0.66879761	0.66554558	0.66531980	0.66334641	0.65916240
56	-0.69999933	0.72230619	0.71948475	0.71932304	0.71790642	0.71499938
61	-0.64999932	0.76781267	0.76566964	0.76555485	0.76454639	0.76246035
66	-0.59999931	0.80762929	0.80573720	0.80565226	0.80490381	0.80335093
71	-0.54999930	0.84257519	0.84070444	0.84063286	0.84001410	0.83879256
76	-0.49999928	0.87269002	0.87099808	0.87094325	0.87045985	0.86952174
81	-0.44999933	0.89859176	0.89713281	0.89709675	0.89677018	0.89610213
86	-0.39999932	0.92112023	0.91973191	0.91970736	0.91948676	0.91902924
91	-0.34999931	0.94052953	0.93919414	0.93917739	0.93901849	0.93869871
96	-0.29999930	0.95701784	0.95572448	0.95571291	0.95559943	0.95537812
101	-0.25000000	0.97074080	0.96948063	0.96947229	0.96939760	0.96924680
106	-0.19999981	0.98181969	0.98058385	0.98057902	0.98053092	0.98043829
111	-0.14999962	0.99034727	0.98912889	0.98912632	0.98910189	0.98904699
116	-0.09999943	0.99639159	0.99518472	0.99518514	0.99517143	0.99514788
121	-0.05000019	1.00000000	0.99879867	0.99879867	0.99879766	0.99878949
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99879903	0.99879879	0.99879539	0.99879122
136	0.10000038	0.99639171	0.99518508	0.99518538	0.99517202	0.99514890
141	0.15000057	0.99034727	0.98912996	0.98912674	0.98910075	0.98904908
146	0.19999981	0.98181987	0.98058420	0.98057914	0.98053205	0.98043764
151	0.25000000	0.97074080	0.96947849	0.96947271	0.96939588	0.96924478
156	0.30000019	0.95701808	0.95572555	0.95571357	0.95560056	0.95537776
161	0.35000038	0.94052964	0.93919557	0.93917811	0.93901902	0.93870008
166	0.40000057	0.92112046	0.91973156	0.91970807	0.91948962	0.91903126
171	0.44999981	0.89859176	0.89713317	0.89709723	0.89677304	0.89610279
176	0.50000000	0.87269002	0.87099987	0.87094337	0.87046325	0.86952275
181	0.55000019	0.84257573	0.84070623	0.84063351	0.84001637	0.83879393
186	0.60000038	0.80762970	0.80573756	0.80565369	0.80490607	0.80335128
191	0.65000057	0.76781309	0.76567179	0.76555568	0.76454753	0.76246101
196	0.69999981	0.72230637	0.71948689	0.71932387	0.71790868	0.71500039
201	0.75000000	0.66879761	0.66554666	0.66532117	0.66334414	0.65916240
206	0.80000019	0.60594052	0.60162151	0.60130119	0.59841061	0.59180272
211	0.85000038	0.53032464	0.52411652	0.52358645	0.51853895	0.50756299
216	0.90000057	0.43592954	0.42491156	0.42365211	0.41328150	0.40054917
221	0.94999981	0.30781817	0.27574486	0.27574223	0.27436215	0.27445018
226	1.00000000	0.0	0.11709058	0.11872745	0.13182300	0.15183187
231	1.05000019	0.0	0.01749223	0.02003659	0.03809048	0.06355703
236	1.10000038	0.0	0.00000000	0.00003667	0.00468009	0.01844511
241	1.15000057	0.0	0.0	0.00000000	0.00017049	0.00342040
246	1.19999981	0.0	0.0	0.00000000	0.00000140	0.00033996
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000096

	OBSERVATIONAL LIMB DARKENING				BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY			
I				SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.91547984	-0.91868204	-0.91875696	-0.91928416	-0.92031002
2	0.53342736	+/-	0.01091558	-0.86729670	-0.87033033	-0.87040132	-0.87090075	-0.87187266
3	0.65479004	+/-	0.00818945	-0.81911355	-0.82197863	-0.82204568	-0.82251740	-0.82343531
4	0.75611269	+/-	0.00561380	-0.77093041	-0.77362698	-0.77369010	-0.77413404	-0.77499795
5	0.78291219	+/-	0.00675163	-0.72274721	-0.72527528	-0.72533447	-0.72575063	-0.72656053
6	0.80480182	+/-	0.00797137	-0.67456406	-0.67692357	-0.67697883	-0.67736727	-0.67812318
7	0.82743675	+/-	0.00623813	-0.62638092	-0.62857187	-0.62862319	-0.62898386	-0.62968582
8	0.86624938	+/-	0.00318797	-0.57819778	-0.58022022	-0.58026755	-0.58060050	-0.58124846
9	0.87631249	+/-	0.00395660	-0.53001463	-0.53186852	-0.53191191	-0.53221714	-0.53281105
10	0.89928478	+/-	0.00349412	-0.48183149	-0.48351681	-0.48355627	-0.48383373	-0.48437369
11	0.92002296	+/-	0.00552572	-0.43364835	-0.43516517	-0.43520063	-0.43545038	-0.43593633
12	0.94750106	+/-	0.00550232	-0.38546520	-0.38681346	-0.38684505	-0.38706702	-0.38749897
13	0.97597575	+/-	0.00535607	-0.33728200	-0.33846176	-0.33848941	-0.33868361	-0.33906156
14	0.97354567	+/-	0.00519064	-0.28909886	-0.29011011	-0.29013377	-0.29030025	-0.29062420
15	0.97948796	+/-	0.00472198	-0.24091572	-0.24175841	-0.24177814	-0.24191684	-0.24218684
16	0.97610867	+/-	0.00377265	-0.19273257	-0.19340670	-0.19342250	-0.19353348	-0.19374949
17	0.98010772	+/-	0.00352922	-0.14454943	-0.14505506	-0.14506686	-0.14515013	-0.14531207
18	0.98225969	+/-	0.00415973	-0.09636629	-0.09670335	-0.09671122	-0.09676671	-0.09687471
19	0.98542905	+/-	0.00458061	-0.04818315	-0.04835169	-0.04835563	-0.04838338	-0.04843737
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.04818315	0.04835169	0.04835563	0.04838338	0.04843737
22	0.98186535	+/-	0.00326987	0.09636629	0.09670335	0.09671122	0.09676671	0.09687471
23	0.98517853	+/-	0.00420880	0.14454943	0.14505506	0.14506686	0.14515013	0.14531207
24	0.97912860	+/-	0.00481493	0.19273257	0.19340670	0.19342250	0.19353348	0.19374949
25	0.97057939	+/-	0.00490139	0.24091572	0.24175841	0.24177814	0.24191684	0.24218684
26	0.96084350	+/-	0.00525466	0.28909886	0.29011011	0.29013377	0.29030025	0.29062420
27	0.94119048	+/-	0.00554555	0.33728200	0.33846176	0.33848941	0.33868361	0.33906156
28	0.91906935	+/-	0.00509574	0.38546520	0.38681346	0.38684505	0.38706702	0.38749897
29	0.91350764	+/-	0.00542074	0.43364835	0.43516517	0.43520063	0.43545038	0.43593633
30	0.89249408	+/-	0.00553969	0.48183149	0.48351681	0.48355627	0.48383373	0.48437369
31	0.85914189	+/-	0.00620985	0.53001463	0.53186852	0.53191191	0.53221714	0.53281105
32	0.84589475	+/-	0.00721151	0.57819778	0.58022022	0.58026755	0.58060050	0.58124846
33	0.81060582	+/-	0.00680591	0.62638092	0.62857187	0.62862319	0.62898386	0.62968582
34	0.78447413	+/-	0.00577597	0.67456406	0.67692357	0.67697883	0.67736727	0.67812318
35	0.73478526	+/-	0.00650398	0.72274721	0.72527528	0.72533447	0.72575063	0.72656053
36	0.68907928	+/-	0.00965067	0.77093041	0.77362698	0.77369010	0.77413404	0.77499795
37	0.63452137	+/-	0.00845271	0.81911355	0.82197863	0.82204568	0.82251740	0.82343531
38	0.48173147	+/-	0.00703276	0.86729670	0.87033033	0.87040132	0.87090075	0.87187266
39	0.24655521	+/-	0.00533949	0.91547984	0.91868204	0.91875696	0.91928416	0.92031002
40	0.0	+/-	0.0	0.96366298	0.96703368	0.96711260	0.96766752	0.96874744

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000138	0.00035996
11	-1.14999866	0.0	0.0	0.00000000	0.00017681	0.00367307
16	-1.09999847	0.0	0.00000000	0.00003164	0.00498131	0.01991322
21	-1.04999924	0.0	0.01848308	0.02131070	0.04113577	0.06876540
26	-0.99999928	0.0	0.12733740	0.12907928	0.14301413	0.16416198
31	-0.94999933	0.33748221	0.29827100	0.29821628	0.29609388	0.29496950
36	-0.89999932	0.46982789	0.45720446	0.45568866	0.44331032	0.42802382
41	-0.84999931	0.56373489	0.55698395	0.55638504	0.55062640	0.53794789
46	-0.79999930	0.63718921	0.63243204	0.63208658	0.62894547	0.62163389
51	-0.74999928	0.69661355	0.69340682	0.69316703	0.69108260	0.68664867
56	-0.69999933	0.74690861	0.74405670	0.74389392	0.74245524	0.73948020
61	-0.64999932	0.78898865	0.78700060	0.78688705	0.78589755	0.78382730
66	-0.59999931	0.82580733	0.82405835	0.82397777	0.82325047	0.82172400
71	-0.54999930	0.85812181	0.85628700	0.85621244	0.85558009	0.85435098
76	-0.49999928	0.88557124	0.88394159	0.88388330	0.88338172	0.88243073
81	-0.44999933	0.90885228	0.90753680	0.90750271	0.90718979	0.90653557
86	-0.39999932	0.92910129	0.92785007	0.92782843	0.92763305	0.92721629
91	-0.34999931	0.94654667	0.94534481	0.94532955	0.94518632	0.94490665
96	-0.29999930	0.96136677	0.96020442	0.96019220	0.96009350	0.95989662
101	-0.25000000	0.97370124	0.97256762	0.97256011	0.97249115	0.97236204
106	-0.19999981	0.98365909	0.98254788	0.98254293	0.98249865	0.98241961
111	-0.14999962	0.99132389	0.99022859	0.99022621	0.99020177	0.99015731
116	-0.09999943	0.99675667	0.99567312	0.99567193	0.99565935	0.99564087
121	-0.05000019	1.00000000	0.99892056	0.99891949	0.99891758	0.99891353
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99892056	0.99891979	0.99891531	0.99891281
136	0.10000038	0.99675679	0.99567360	0.99567187	0.99565971	0.99564064
141	0.15000057	0.99132395	0.99022931	0.99022657	0.99020177	0.99015933
146	0.19999981	0.98365927	0.98254836	0.98254335	0.98249865	0.98242009
151	0.25000000	0.97370124	0.97256762	0.97255993	0.97249228	0.97236139
156	0.30000019	0.96136695	0.96020395	0.96019298	0.96009159	0.95989662
161	0.35000038	0.94654685	0.94534671	0.94532937	0.94519049	0.94490623
166	0.40000057	0.92910147	0.92785174	0.92782927	0.92763531	0.92721605
171	0.44999981	0.90885228	0.90753680	0.90750295	0.90718901	0.90653694
176	0.50000000	0.88557124	0.88394302	0.88388348	0.88338250	0.88243121
181	0.55000019	0.85812235	0.85628748	0.85621405	0.85558009	0.85435098
186	0.60000038	0.82580769	0.82406026	0.82397872	0.82325351	0.82172352
191	0.65000057	0.78898901	0.78700131	0.78688812	0.78589833	0.78382844
196	0.69999981	0.74690884	0.74405766	0.74389482	0.74245828	0.73948044
201	0.75000000	0.69661355	0.69340801	0.69316822	0.69108450	0.68665165
206	0.80000019	0.63719016	0.63243490	0.63208854	0.62894547	0.62165302
211	0.85000038	0.56373584	0.55698705	0.55638766	0.55063969	0.53802973
216	0.90000057	0.46982878	0.45720732	0.45570368	0.44347453	0.42828476
221	0.94999981	0.33748287	0.29897100	0.29889035	0.29665822	0.29546058
226	1.00000000	0.0	0.12754631	0.12928551	0.14319807	0.16430545
231	1.05000019	0.0	0.01847107	0.02129906	0.04112622	0.06875771
236	1.10000038	0.0	0.00000000	0.00003177	0.00498311	0.01991605
241	1.15000057	0.0	0.0	0.00000000	0.00017732	0.00367645
246	1.19999981	0.0	0.0	0.00000000	0.00000141	0.00036172
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000065

I	OBSERVATIONAL LIMB DARKENING			BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.93197292	-0.93542063	-0.93549168	-0.93596995	-0.93691206
2	0.53342736	+/-	0.01091558	-0.88292170	-0.88618797	-0.88625526	-0.88670838	-0.88760090
3	0.65479004	+/-	0.00818945	-0.83387047	-0.83695531	-0.83701885	-0.83744681	-0.83828974
4	0.75611269	+/-	0.00561380	-0.78481930	-0.78772265	-0.78778249	-0.78818524	-0.78897858
5	0.78291219	+/-	0.00675163	-0.73576808	-0.73848993	-0.73854607	-0.73892361	-0.73966742
6	0.80480182	+/-	0.00797137	-0.68671685	-0.68925726	-0.68930966	-0.68966204	-0.69035625
7	0.82743675	+/-	0.00623813	-0.63766563	-0.64002460	-0.64007324	-0.64040047	-0.64104509
8	0.86624938	+/-	0.00318797	-0.58861446	-0.59079194	-0.59083682	-0.59113890	-0.59173393
9	0.87631249	+/-	0.00395660	-0.53956324	-0.54155928	-0.54160041	-0.54187733	-0.54242277
10	0.89928478	+/-	0.00349412	-0.49051201	-0.49232662	-0.49236405	-0.49261576	-0.49311161
11	0.92002296	+/-	0.00552572	-0.44146085	-0.44309396	-0.44312763	-0.44335419	-0.44380045
12	0.94750106	+/-	0.00550232	-0.39240962	-0.39386129	-0.39389122	-0.39409262	-0.39448929
13	0.97597575	+/-	0.00535607	-0.34335840	-0.34462863	-0.34465480	-0.34483099	-0.34517813
14	0.97354567	+/-	0.00519064	-0.29430723	-0.29539597	-0.29541838	-0.29556942	-0.29586697
15	0.97948796	+/-	0.00472198	-0.24525601	-0.24616331	-0.24618202	-0.24630785	-0.24655581
16	0.97610867	+/-	0.00377265	-0.19620478	-0.19693065	-0.19694561	-0.19704628	-0.19724464
17	0.98010772	+/-	0.00352922	-0.14715362	-0.14769799	-0.14770919	-0.14778471	-0.14793348
18	0.98225969	+/-	0.00415973	-0.09810239	-0.09846532	-0.09847277	-0.09852314	-0.09862232
19	0.98542905	+/-	0.00458061	-0.04905121	-0.04923267	-0.04923641	-0.04926158	-0.04931116
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.04905121	0.04923267	0.04923641	0.04926158	0.04931116
22	0.98186535	+/-	0.00326987	0.09810239	0.09846532	0.09847277	0.09852314	0.09862232
23	0.98517853	+/-	0.00420880	0.14715362	0.14769799	0.14770919	0.14778471	0.14793348
24	0.97912860	+/-	0.00481493	0.19620478	0.19693065	0.19694561	0.19704628	0.19724464
25	0.97057939	+/-	0.00490139	0.24525601	0.24616331	0.24618202	0.24630785	0.24655581
26	0.96084350	+/-	0.00525466	0.29430723	0.29539597	0.29541838	0.29556942	0.29586697
27	0.94119048	+/-	0.00554555	0.34335840	0.34462863	0.34465480	0.34483099	0.34517813
28	0.91906935	+/-	0.00509574	0.39240962	0.39386129	0.39389122	0.39409262	0.39448929
29	0.91350764	+/-	0.00542074	0.44146085	0.44309396	0.44312763	0.44335419	0.44380045
30	0.89249408	+/-	0.00553969	0.49051201	0.49232662	0.49236405	0.49261576	0.49311161
31	0.85914189	+/-	0.00620985	0.53956324	0.54155928	0.54160041	0.54187733	0.54242277
32	0.84589475	+/-	0.00721151	0.58861446	0.59079194	0.59083682	0.59113890	0.59173393
33	0.81060582	+/-	0.00680591	0.63766563	0.64002460	0.64007324	0.64040047	0.64104509
34	0.78447413	+/-	0.00577597	0.68671685	0.68925726	0.68930966	0.68966204	0.69035625
35	0.73478526	+/-	0.00650398	0.73576808	0.73848993	0.73854607	0.73892361	0.73966742
36	0.68907928	+/-	0.00965067	0.78481930	0.78772265	0.78778249	0.78818524	0.78897858
37	0.63452137	+/-	0.00845271	0.83387047	0.83695531	0.83701885	0.83744681	0.83828974
38	0.48173147	+/-	0.00703276	0.88292170	0.88618797	0.88625526	0.88670838	0.88760090
39	0.24655521	+/-	0.00533949	0.93197292	0.93542063	0.93549168	0.93596995	0.93691206
40	0.0	+/-	0.0	0.98102409	0.98465329	0.98472810	0.98523152	0.98622322

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000226	0.00050704
11	-1.14999866	0.0	0.0	0.00000000	0.00026662	0.00489337
16	-1.09999847	0.0	0.00000000	0.00007163	0.00696301	0.02554640
21	-1.04999924	0.0	0.02717854	0.03044194	0.05368293	0.08510798
26	-0.99999928	0.0	0.15973425	0.16140342	0.17481911	0.19514972
31	-0.94999933	0.40455270	0.35228544	0.35177499	0.34565949	0.33921856
36	-0.89999932	0.52706265	0.51473641	0.51311904	0.49803770	0.47815078
41	-0.84999931	0.61227018	0.60594594	0.60537618	0.59970003	0.58583182
46	-0.79999930	0.67836261	0.67391199	0.67359179	0.67067403	0.66355628
51	-0.74999928	0.73137033	0.72845602	0.72823590	0.72632509	0.72223371
56	-0.69999933	0.77613288	0.77351499	0.77336681	0.77206635	0.76935816
61	-0.64999932	0.81333989	0.81157064	0.81146944	0.81058478	0.80873227
66	-0.59999931	0.84589469	0.84434158	0.84427106	0.84363627	0.84229153
71	-0.54999930	0.87446713	0.87284106	0.87277675	0.87222594	0.87115270
76	-0.49999928	0.89874697	0.89730281	0.89725202	0.89681786	0.89598644
81	-0.44999933	0.91934723	0.91817981	0.91815031	0.91787821	0.91730976
86	-0.39999932	0.93726474	0.93615615	0.93613642	0.93596578	0.93560392
91	-0.34999931	0.95270145	0.95163584	0.95162272	0.95150101	0.95125622
96	-0.29999930	0.96581507	0.96478534	0.96477449	0.96468842	0.96451706
101	-0.25000000	0.97672933	0.97572559	0.97571850	0.97566116	0.97554493
106	-0.19999981	0.98554063	0.98455614	0.98455274	0.98451650	0.98444313
111	-0.14999962	0.99232280	0.99135357	0.99135160	0.99132979	0.99129093
116	-0.09999943	0.99713010	0.99617100	0.99617016	0.99615991	0.99614179
121	-0.05000019	1.00000000	0.99904549	0.99904418	0.99904096	0.99903595
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99904525	0.99904436	0.99904054	0.99903572
136	0.10000038	0.99713016	0.99617177	0.99616998	0.99616033	0.99614060
141	0.15000057	0.99232292	0.99135405	0.99135184	0.99132979	0.99128973
146	0.19999981	0.98554075	0.98455715	0.98455274	0.98451531	0.98444384
151	0.25000000	0.97672933	0.97572613	0.97571868	0.97566032	0.97554636
156	0.30000019	0.96581525	0.96478486	0.96477497	0.96468765	0.96451783
161	0.35000038	0.95270157	0.95163685	0.95162278	0.95150018	0.95125622
166	0.40000057	0.93726498	0.93615568	0.93613642	0.93596661	0.93560219
171	0.44999981	0.91934729	0.91818005	0.91815042	0.91787744	0.91731054
176	0.50000000	0.89874697	0.89730304	0.89725238	0.89681786	0.89598715
181	0.55000019	0.87446755	0.87284255	0.87277758	0.87222511	0.87115371
186	0.60000038	0.84589505	0.84434259	0.84427196	0.84364033	0.84229249
191	0.65000057	0.81334019	0.81157190	0.81147045	0.81058723	0.80873495
196	0.69999981	0.77613306	0.77351475	0.77336764	0.77206552	0.76936060
201	0.75000000	0.73137033	0.72845578	0.72823614	0.72632468	0.72223419
206	0.80000019	0.67836356	0.67391378	0.67359352	0.67067528	0.66360778
211	0.85000038	0.61227113	0.60594952	0.60537827	0.59974211	0.58610994
216	0.90000057	0.52706349	0.51474077	0.51316512	0.49862313	0.47906375
221	0.94999981	0.40455347	0.35480249	0.35420060	0.34768426	0.34097922
226	1.00000000	0.0	0.16020477	0.16186786	0.17523134	0.19547099
231	1.05000019	0.0	0.02715293	0.03041720	0.05366249	0.08509094
236	1.10000038	0.0	0.00000000	0.00007188	0.00696646	0.02555173
241	1.15000057	0.0	0.0	0.00000000	0.00026768	0.00490026
246	1.19999981	0.0	0.0	0.00000000	0.00000231	0.00051086
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000224

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.95454210	-0.95989114	-0.95995945	-0.96040267	-0.96126252
2	0.53342736	+/-	0.01091558	-0.90430307	-0.90937054	-0.90943527	-0.90985519	-0.91066974
3	0.65479004	+/-	0.00818945	-0.85406399	-0.85884994	-0.85891110	-0.85930765	-0.86007696
4	0.75611269	+/-	0.00561380	-0.80382496	-0.80832940	-0.80838692	-0.80876017	-0.80948424
5	0.78291219	+/-	0.00675163	-0.75358588	-0.75780880	-0.75786269	-0.75821263	-0.75889146
6	0.80480182	+/-	0.00797137	-0.70334679	-0.70728821	-0.70733851	-0.70766515	-0.70829868
7	0.82743675	+/-	0.00623813	-0.65310776	-0.65676761	-0.65681434	-0.65711761	-0.65770590
8	0.86624938	+/-	0.00318797	-0.60286868	-0.60624701	-0.60629016	-0.60657012	-0.60711318
9	0.87631249	+/-	0.00395660	-0.55262965	-0.55572641	-0.55576599	-0.55602258	-0.55652040
10	0.89928478	+/-	0.00349412	-0.50239056	-0.50520587	-0.50524181	-0.50547510	-0.50592762
11	0.92002296	+/-	0.00552572	-0.45215154	-0.45468527	-0.45471764	-0.45492756	-0.45533484
12	0.94750106	+/-	0.00550232	-0.40191245	-0.40416467	-0.40419346	-0.40438008	-0.40474212
13	0.97597575	+/-	0.00535607	-0.35167336	-0.35364407	-0.35366923	-0.35383254	-0.35414934
14	0.97354567	+/-	0.00519064	-0.30143434	-0.30312347	-0.30314505	-0.30328506	-0.30355656
15	0.97948796	+/-	0.00472198	-0.25119525	-0.25260293	-0.25262088	-0.25273752	-0.25296378
16	0.97610667	+/-	0.00377265	-0.20095623	-0.20208234	-0.20209670	-0.20219004	-0.20237106
17	0.98010772	+/-	0.00352922	-0.15071714	-0.15156174	-0.15157253	-0.15164250	-0.15177828
18	0.98225969	+/-	0.00415973	-0.10047811	-0.10104114	-0.10104835	-0.10109502	-0.10118550
19	0.98542905	+/-	0.00458061	-0.05023906	-0.05052059	-0.05052418	-0.05054751	-0.05059277
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05023906	0.05052059	0.05052418	0.05054751	0.05059277
22	0.98186535	+/-	0.00326987	0.10047811	0.10104114	0.10104835	0.10109502	0.10118550
23	0.98517853	+/-	0.00420880	0.15071714	0.15156174	0.15157253	0.15164250	0.15177828
24	0.97912860	+/-	0.00481493	0.20095623	0.20208234	0.20209670	0.20219004	0.20237106
25	0.97057939	+/-	0.00490139	0.25119525	0.25260293	0.25262088	0.25273752	0.25296378
26	0.96084350	+/-	0.00525466	0.30143434	0.30312347	0.30314505	0.30328506	0.30355656
27	0.94119048	+/-	0.00554555	0.35167336	0.35364407	0.35366923	0.35383254	0.35414934
28	0.91906935	+/-	0.00509574	0.40191245	0.40416467	0.40419346	0.40438008	0.40474212
29	0.91350764	+/-	0.00542074	0.45215154	0.45468527	0.45471764	0.45492756	0.45533484
30	0.89249408	+/-	0.00553969	0.50239056	0.50520587	0.50524181	0.50547510	0.50592762
31	0.85914189	+/-	0.00620985	0.55262965	0.55572641	0.55576599	0.55602258	0.55652040
32	0.84589475	+/-	0.00721151	0.60286868	0.60624701	0.60629016	0.60657012	0.60711318
33	0.81060582	+/-	0.00680591	0.65310776	0.65676761	0.65681434	0.65711761	0.65770590
34	0.78447413	+/-	0.00577597	0.70334679	0.70728821	0.70733851	0.70766515	0.70829868
35	0.73478526	+/-	0.00650398	0.75358588	0.75780880	0.75786269	0.75821263	0.75889146
36	0.68907928	+/-	0.00965067	0.80382496	0.80832940	0.80838692	0.80876017	0.80948424
37	0.63452137	+/-	0.00845271	0.85406399	0.85884994	0.85891110	0.85930765	0.86007696
38	0.48173147	+/-	0.00703276	0.90430307	0.90937054	0.90943527	0.90985519	0.91066974
39	0.24655521	+/-	0.00533949	0.95454210	0.95989114	0.95995945	0.96040267	0.96126252
40	0.0	+/-	0.0	1.00478077	1.01041126	1.01048279	1.01095009	1.0118551[illegible]

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000214	0.00048150
11	-1.14999866	0.0	0.0	0.00000000	0.00025293	0.00466327
16	-1.09999847	0.0	0.00000000	0.00006810	0.00661766	0.02441629
21	-1.04999924	0.0	0.02573613	0.02887063	0.05121313	0.08162451
26	-0.99999928	0.0	0.15267235	0.15433550	0.16769308	0.18796998
31	-0.94999933	0.38823700	0.33933270	0.33891714	0.33364218	0.32834572
36	-0.89999932	0.51187015	0.49981463	0.49826229	0.48396623	0.46529365
41	-0.84999931	0.59894663	0.59260768	0.59204316	0.58646625	0.57307017
46	-0.79999930	0.66684860	0.66239375	0.66207182	0.65914214	0.65207714
51	-0.74999928	0.72164226	0.71865219	0.71842927	0.71648979	0.71234959
56	-0.69999933	0.76794469	0.76526099	0.76510942	0.76377630	0.76100534
61	-0.64999932	0.80650836	0.80467838	0.80457336	0.80366307	0.80175197
66	-0.59999931	0.84025013	0.83864254	0.83856910	0.83791357	0.83651704
71	-0.54999930	0.86986440	0.86818111	0.86811477	0.86754292	0.86642849
76	-0.49999928	0.89503229	0.89353710	0.89348453	0.89303637	0.89217025
81	-0.44999933	0.91638833	0.91517878	0.91514856	0.91486627	0.91427499
86	-0.39999932	0.93496317	0.93381310	0.93379438	0.93361717	0.93323976
91	-0.34999931	0.95096624	0.94986248	0.94984829	0.94972438	0.94946700
96	-0.29999930	0.96456093	0.96349251	0.96348236	0.96339458	0.96321720
101	-0.25000000	0.97587562	0.97483420	0.97482800	0.97476971	0.97464877
106	-0.19999981	0.98501015	0.98398995	0.98398602	0.98395085	0.98387301
111	-0.14999962	0.99204117	0.99103647	0.99103433	0.99101371	0.99097222
116	-0.09999943	0.99702483	0.99602985	0.99602991	0.99601966	0.99600160
121	-0.05000019	1.00000000	0.99900901	0.99900937	0.99901015	0.99900413
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99900967	0.99900961	0.99900764	0.99900389
136	0.10000038	0.99702495	0.99603051	0.99602968	0.99602181	0.99600220
141	0.15000057	0.99204123	0.99103671	0.99103421	0.99101621	0.99097306
146	0.19999981	0.98501033	0.98399043	0.98398650	0.98394871	0.98387533
151	0.25000000	0.97587562	0.97483420	0.97482842	0.97476792	0.97464985
156	0.30000019	0.96456110	0.96349251	0.96348327	0.96339595	0.96321660
161	0.35000038	0.95096630	0.94986272	0.94984835	0.94972402	0.94946676
166	0.40000057	0.93496335	0.93381357	0.93379450	0.93361998	0.93324059
171	0.44999981	0.91638833	0.91517925	0.91514868	0.91486734	0.91427714
176	0.50000000	0.89503229	0.89353776	0.89348465	0.89303499	0.89217174
181	0.55000019	0.86986482	0.86818200	0.86811543	0.86754364	0.86642933
186	0.60000038	0.84025055	0.83864295	0.83857006	0.83791608	0.83651787
191	0.65000057	0.80650860	0.80467862	0.80457419	0.80366343	0.80175412
196	0.69999981	0.76794481	0.76526165	0.76511049	0.76377738	0.76100743
201	0.75000000	0.72164226	0.71865243	0.71842974	0.71648979	0.71234852
206	0.80000019	0.66684949	0.66239619	0.66207361	0.65914249	0.65212905
211	0.85000038	0.59894753	0.59260923	0.59204519	0.58650738	0.57333857
216	0.90000057	0.51187098	0.49981773	0.49830621	0.48452669	0.46616757
221	0.94999981	0.38823766	0.34173781	0.34123528	0.33557743	0.33002990
226	1.00000000	0.0	0.15311629	0.15477401	0.16808206	0.18827319
231	1.05000019	0.0	0.02571205	0.02884736	0.05119384	0.08160853
236	1.10000038	0.0	0.00000000	0.00006833	0.00662091	0.02442129
241	1.15000057	0.0	0.0	0.00000000	0.00025393	0.00466976
246	1.19999981	0.0	0.0	0.00000000	0.00000219	0.00048510
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000214

I	OBSERVATIONAL LIMB DARKENING	SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383 +/- 0.00996722	-0.94842213	-0.95344007	-0.95351118	-0.95396554	-0.95485151
2	0.53342736 +/- 0.01091558	-0.89850521	-0.90325898	-0.90332639	-0.90375680	-0.90459615
3	0.65479004 +/- 0.00818945	-0.84858823	-0.85307795	-0.85314161	-0.85354811	-0.85434079
4	0.75611269 +/- 0.00561380	-0.79867131	-0.80289692	-0.80295682	-0.80333942	-0.80408549
5	0.78291219 +/- 0.00675163	-0.74875432	-0.75271583	-0.75277197	-0.75313067	-0.75383013
6	0.80480182 +/- 0.00797137	-0.69883734	-0.70253479	-0.70258719	-0.70292199	-0.70357478
7	0.82743675 +/- 0.00623813	-0.64892042	-0.65235370	-0.65240240	-0.65271324	-0.65331942
8	0.86624938 +/- 0.00318797	-0.59900343	-0.60217267	-0.60221761	-0.60250455	-0.60306412
9	0.87631249 +/- 0.00395660	-0.54908651	-0.55199158	-0.55203277	-0.55229580	-0.55280876
10	0.89928478 +/- 0.00349412	-0.49916953	-0.50181055	-0.50184798	-0.50208712	-0.50255340
11	0.92002296 +/- 0.00552572	-0.44925261	-0.45162946	-0.45166320	-0.45187837	-0.45229805
12	0.94750106 +/- 0.00550232	-0.39933562	-0.40144843	-0.40147841	-0.40166968	-0.40204275
13	0.97597575 +/- 0.00535607	-0.34941864	-0.35126740	-0.35129356	-0.35146099	-0.35178739
14	0.97354567 +/- 0.00519064	-0.29950172	-0.30108631	-0.30110878	-0.30125225	-0.30153203
15	0.97948796 +/- 0.00472198	-0.24958473	-0.25090528	-0.25092399	-0.25104356	-0.25127667
16	0.97610867 +/- 0.00377265	-0.19966781	-0.20072418	-0.20073920	-0.20083481	-0.20102137
17	0.98010772 +/- 0.00352922	-0.14975083	-0.15054315	-0.15055436	-0.15062612	-0.15076602
18	0.98225969 +/- 0.00415973	-0.09983391	-0.10036206	-0.10036957	-0.10041738	-0.10051066
19	0.98542905 +/- 0.00458061	-0.04991696	-0.05018106	-0.05018480	-0.05020871	-0.05025534
20	1.00000000 +/- 0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104 +/- 0.00376810	0.04991696	0.05018106	0.05018480	0.05020871	0.05025534
22	0.98186535 +/- 0.00326987	0.09983391	0.10036206	0.10036957	0.10041738	0.10051066
23	0.98517853 +/- 0.00420880	0.14975083	0.15054315	0.15055436	0.15062612	0.15076602
24	0.97912860 +/- 0.00481493	0.19966781	0.20072418	0.20073920	0.20083481	0.20102137
25	0.97057939 +/- 0.00490139	0.24958473	0.25090528	0.25092399	0.25104356	0.25127667
26	0.96084350 +/- 0.00525466	0.29950172	0.30108631	0.30110878	0.30125225	0.30153203
27	0.94119048 +/- 0.00554555	0.34941864	0.35126740	0.35129356	0.35146099	0.35178739
28	0.91906935 +/- 0.00509574	0.39933562	0.40144843	0.40147841	0.40166968	0.40204275
29	0.91350764 +/- 0.00542074	0.44925261	0.45162946	0.45166320	0.45187837	0.45229805
30	0.89249408 +/- 0.00553969	0.49916953	0.50181055	0.50184798	0.50208712	0.50255340
31	0.85914189 +/- 0.00620985	0.54908651	0.55199158	0.55203277	0.55229580	0.55280876
32	0.84589475 +/- 0.00721151	0.59900343	0.60217267	0.60221761	0.60250455	0.60306412
33	0.81060582 +/- 0.00680591	0.64892042	0.65235370	0.65240240	0.65271324	0.65331942
34	0.78447413 +/- 0.00577597	0.69883734	0.70253479	0.70258719	0.70292199	0.70357478
35	0.73478526 +/- 0.00650398	0.74875432	0.75271583	0.75277197	0.75313067	0.75383013
36	0.68907926 +/- 0.00965067	0.79867131	0.80289692	0.80295682	0.80333942	0.80408549
37	0.63452137 +/- 0.00845271	0.84858823	0.85307795	0.85314161	0.85354811	0.85434079
38	0.48173147 +/- 0.00703276	0.89850521	0.90325898	0.90332639	0.90375680	0.90459615
39	0.24655521 +/- 0.00533949	0.94842213	0.95344007	0.95351118	0.95396554	0.95485151
40	0.0 +/- 0.0	0.99833912	1.00362110	1.00369549	1.00417423	1.0051059

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000214	0.00050433
11	-1.14999866	0.0	0.0	0.00000000	0.00025977	0.00492065
16	-1.09999847	0.0	0.00000000	0.00006133	0.00693190	0.02585593
21	-1.04999924	0.0	0.02686121	0.03025686	0.05424928	0.08655888
26	-0.99999928	0.0	0.16302073	0.16474110	0.17856961	0.19947445
31	-0.94999933	0.41565776	0.36093861	0.36040586	0.35402811	0.34719026
36	-0.89999932	0.54024106	0.52724576	0.52552181	0.50973088	0.48892468
41	-0.84999931	0.62560612	0.61906952	0.61847246	0.61248761	0.59793264
46	-0.79999930	0.69123828	0.68648058	0.68614805	0.68309355	0.67563361
51	-0.74999928	0.74286914	0.73995817	0.73973167	0.73774409	0.73349452
56	-0.69999933	0.78632510	0.78368402	0.78353941	0.78221774	0.77945435
61	-0.64999932	0.82210028	0.82039696	0.82029915	0.81941736	0.81756020
66	-0.59999931	0.85340238	0.85191107	0.85184485	0.85121816	0.84987730
71	-0.54999930	0.88087523	0.87926817	0.87920594	0.87864619	0.87756950
76	-0.49999928	0.90405071	0.90263480	0.90258634	0.90214372	0.90130478
81	-0.44999933	0.92357194	0.92246389	0.92243934	0.92216885	0.92160589
86	-0.39999932	0.94055098	0.93949807	0.93948454	0.93932265	0.93897343
91	-0.34999931	0.955179C4	0.95416945	0.95415974	0.95404291	0.95381153
96	-0.29999930	0.96760571	0.96662843	0.96662325	0.96653920	0.96637928
101	-0.25000000	0.97794831	0.97699624	0.97698969	0.97693622	0.97682858
106	-0.19999981	0.98629802	0.98536545	0.98536068	0.98532641	0.98525995
111	-0.14999962	0.99272490	0.99180591	0.99180514	0.99178541	0.99174786
116	-0.09999943	0.99728042	0.99637181	0.99636751	0.99636066	0.99634516
121	-0.05000019	1.00000000	0.99909395	0.99909508	0.99909282	0.99908859
126	0.0	1.00000CC0	1.00000C0C	1.00000000	1.00000000	1.00000000
131	0.05000019	1.C0000000	0.99909490	0.99909323	0.99909252	0.99908769
136	0.10000038	0.99728048	0.99637121	0.99636936	0.99636281	0.99634480
141	0.15000057	0.99272507	0.99180555	0.99180329	0.99178386	0.99174726
146	0.19999981	0.98629814	0.98536527	0.98536164	0.98532701	0.98526084
151	0.25000000	0.97794831	0.97699648	0.97699064	0.97693717	0.97682804
156	0.30000019	0.96760595	0.96662843	0.96662354	0.96654105	0.96637893
161	0.35000038	0.95517915	0.95416868	0.95416009	0.95404226	0.95381302
166	0.40000057	0.94055104	0.93949884	0.93948495	0.93932229	0.93897402
171	0.44999981	0.92357206	0.92246372	0.92243952	0.92216730	0.92160702
176	0.50000000	0.90405071	0.90263462	0.90258676	0.90214497	0.90130645
181	0.55000019	0.88087565	0.87926859	0.87920672	0.87864745	0.87757045
186	0.60000038	0.85340273	0.85191143	0.85184556	0.85121936	0.84987897
191	0.65000057	0.82210064	0.82039756	0.82029980	0.81941956	0.81756300
196	0.69999981	C.78632534	0.78368598	0.78354025	0.78221929	0.77945530
201	0.75000000	0.74286914	0.73995894	0.73973268	0.73774624	0.73349601
206	0.80000019	0.69123918	0.68648255	0.68615037	0.68309414	0.67567462
211	0.85000038	0.62560701	0.61907244	0.61847478	0.61252099	0.59814811
216	0.90000057	C.5402419C	0.52724886	0.52555728	0.51017827	0.48962039
221	0.94999981	0.41565841	0.36284155	0.36223930	0.35555452	0.34852213
226	1.00000000	C.0	0.16344577	0.16516113	0.17894232	0.19976360
231	1.05000019	C.C	0.0268375C	0.03023393	0.05423033	0.08654326
236	1.10000038	0.0	C.C000000C	0.00006156	0.00693515	0.02586090
241	1.15000057	C.0	C.0	0.00000000	0.00026076	0.00492706
246	1.19999981	C.0	0.0	0.00000000	0.00000219	0.00050783
251	1.25000000	C.0	C.0	0.0	0.00000000	0.00000172

I	OBSERVATIONAL LIMB DARKENING	SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383 +/- 0.00996722	-0.96120751	-C.96653545	-0.96660876	-0.96702814	-0.96784914
2	0.53342736 +/- 0.01091558	-0.91061765	-0.91566515	-0.91573465	-0.91613191	-0.91690969
3	0.65479004 +/- 0.00818945	-0.86002779	-0.86479485	-0.86486048	-0.86523569	-0.86597025
4	0.75611269 +/- 0.C0561380	-0.80943793	-0.81392461	-0.81398636	-0.81433952	-0.81503087
5	0.78291219 +/- 0.00675163	-0.758848C1	-0.76305431	-0.76311219	-0.76344329	-0.76409143
6	0.80480182 +/- 0.00797137	-0.70825815	-0.71218401	-0.71223801	-0.71254706	-0.71315199
7	0.82743675 +/- 0.00623813	-0.65766829	-0.66131371	-0.66136390	-0.66165084	-0.66221255
8	0.86624938 +/- 0.00318797	-0.60707843	-0.61044341	-0.61048973	-0.61075461	-0.61127311
9	0.87631249 +/- 0.00395660	-0.55648857	-0.55957311	-0.55961561	-0.55985838	-0.56033367
10	0.89926478 +/- 0.00349412	-0.50589865	-0.50870287	-0.50874144	-0.50896215	-0.50939429
11	0.92002296 +/- 0.0C552572	-0.45530879	-0.45783257	-0.45786732	-0.45806593	-0.45845485
12	0.94750106 +/- 0.0C550232	-C.40471894	-0.40696228	-0.40699315	-0.40716976	-0.40751541
13	0.97597575 +/- 0.00535607	-0.35412908	-0.35609198	-0.35611898	-0.35627353	-0.35657597
14	0.97354567 +/- 0.C0519064	-C.30353922	-0.30522168	-0.30524486	-0.30537730	-0.30563653
15	0.97948796 +/- 0.CC472198	-C.25294930	-0.25435144	-0.25437069	-0.25448108	-0.25469714
16	0.97610867 +/- 0.00377265	-0.20235944	-0.20348114	-0.20349658	-0.20358485	-0.20375770
17	0.98010772 +/- 0.00352922	-0.15176958	-0.15261084	-0.15262240	-0.15268862	-0.15281826
18	0.98225969 +/- 0.00415973	-0.10117972	-0.10174054	-0.10174829	-0.10179240	-0.10187882
19	0.98542905 +/- 0.00458061	-0.05058987	-0.05087029	-0.05087415	-0.05089622	-0.05093943
20	1.00000000 +/- 0.00369757	C.0	0.0	0.0	0.0	0.0
21	0.99866104 +/- 0.00376810	0.C5C58987	0.05087C29	0.05087415	0.05089622	0.05093943
22	0.98186535 +/- 0.00326987	0.10117972	0.10174054	0.10174829	0.10179240	0.10187882
23	0.98517853 +/- 0.0042088C	0.15176958	0.15261084	0.15262240	0.15268862	0.15281826
24	0.97912860 +/- 0.00481493	C.20235944	0.20348114	0.20349658	0.20358485	0.20375770
25	0.97057939 +/- 0.00490139	0.25294930	0.25435144	0.25437069	0.25448108	0.25469714
26	0.96084350 +/- 0.00525466	0.30353922	C.30522168	0.30524486	0.30537730	0.30563653
27	0.94119048 +/- 0.00554555	0.35412908	0.35609198	0.35611898	0.35627353	0.35657597
28	0.91906935 +/- 0.C0509574	0.40471894	0.40696228	0.40699315	0.40716976	0.40751541
29	0.91350764 +/- 0.CC542074	0.45530879	0.45783257	0.45786732	0.45806593	0.45845485
30	0.89249408 +/- 0.C0553969	C.50589865	C.50870287	0.50874144	0.50896215	0.50939429
31	0.85914189 +/- 0.C0620985	0.55648857	0.55957311	0.55961561	0.55985838	0.56033367
32	0.84589475 +/- 0.C0721151	0.60707843	0.61044341	0.61048973	0.61075461	0.61127311
33	0.81060582 +/- 0.C0680591	0.65766829	0.66131371	0.66136390	0.66165084	0.66221255
34	0.78447413 +/- 0.C0577597	0.70825815	0.71218401	0.71223801	0.71254706	0.71315199
35	0.73478526 +/- 0.00650398	0.758848C1	0.76305431	0.76311219	0.76344329	0.76409143
36	0.68907928 +/- 0.C0965067	C.80943793	0.81392461	0.81398636	0.81433952	0.81503087
37	0.63452137 +/- 0.C0845271	0.86C02779	0.86479485	0.86486048	0.86523569	0.86597025
38	0.48173147 +/- 0.C0703276	C.91061765	0.91566515	0.91573465	0.91613191	0.91690969
39	0.24655521 +/- 0.00533949	0.96120751	0.96653545	0.96660876	0.96702814	0.96784914
40	0.0 +/- 0.0	1.01179695	1.01740551	1.01748276	1.01792431	1.01878834

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000197	0.00047177
11	-1.14999866	0.0	0.0	0.00000000	0.00024117	0.00463950
16	-1.09999847	0.0	0.00000000	0.00005479	0.00649293	0.02451827
21	-1.04999924	0.0	0.02497803	0.02824343	0.05129328	0.08256471
26	-0.99999928	0.0	0.15495294	0.15668380	0.17057270	0.19158703
31	-0.94999933	0.39794499	0.34693432	0.34651613	0.34113878	0.33564878
36	-0.89999932	0.52488112	0.51192117	0.51024711	0.49523133	0.47567672
41	-0.84999931	0.61256325	0.60591078	0.60530937	0.59933776	0.58516085
46	-0.79999930	0.68012917	0.67533630	0.67499989	0.67189312	0.66441023
51	-0.74999928	0.73358339	0.73058450	0.73035419	0.72831875	0.72398120
56	-0.69999933	0.77857953	0.77585173	0.77570206	0.77433580	0.77148831
61	-0.64999932	0.81563568	0.81387299	0.81377310	0.81285739	0.81093454
66	-0.59999931	0.84805846	0.84651440	0.84644800	0.84579438	0.84440655
71	-0.54999930	0.87651497	0.87485349	0.87479109	0.87420976	0.87309289
76	-0.49999928	0.90053058	0.89906597	0.89901793	0.89855689	0.89768958
81	-0.44999933	0.92076796	0.91961962	0.91959560	0.91931295	0.91873020
86	-0.39999932	0.93836993	0.93727916	0.93726176	0.93709815	0.93673140
91	-0.34999931	0.95353466	0.95248801	0.95247531	0.95235622	0.95211405
96	-0.29999930	0.96641725	0.96540475	0.96539569	0.96531242	0.96514386
101	-0.25000000	0.97713929	0.97615182	0.97614431	0.97609031	0.97597677
106	-0.19999981	0.98579538	0.98482853	0.98482424	0.98478943	0.98471874
111	-0.14999962	0.99245799	0.99150538	0.99150318	0.99148375	0.99144495
116	-0.09999943	0.99718070	0.99623805	0.99623573	0.99622816	0.99620998
121	-0.05000019	1.00000000	0.99906117	0.99906069	0.99906027	0.99905396
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99906152	0.99906069	0.99906027	0.99905556
136	0.10000038	0.99718076	0.99623805	0.99623573	0.99622786	0.99621087
141	0.15000057	0.99245816	0.99150556	0.99150497	0.99148345	0.99144512
146	0.19999981	0.98579544	0.98482889	0.98482335	0.98478973	0.98472035
151	0.25000000	0.97713929	0.97615254	0.97614610	0.97609001	0.97597784
156	0.30000019	0.96641743	0.96540457	0.96539569	0.96531212	0.96514529
161	0.35000038	0.95353472	0.95248783	0.95247447	0.95235652	0.95211476
166	0.40000057	0.93837005	0.93727916	0.93726087	0.93709576	0.93673229
171	0.44999981	0.92076808	0.91962016	0.91959620	0.91931385	0.91873002
176	0.50000000	0.90053058	0.89906597	0.89901817	0.89855951	0.89769030
181	0.55000019	0.87651545	0.87485445	0.87479198	0.87421125	0.87309533
186	0.60000038	0.84805882	0.84651572	0.84644854	0.84579706	0.84440708
191	0.65000057	0.81563604	0.81387353	0.81377387	0.81286091	0.81093663
196	0.69999981	0.77857977	0.77585304	0.77570301	0.77433580	0.77149010
201	0.75000000	0.73358339	0.73058528	0.73035508	0.72832197	0.72398192
206	0.80000019	0.68013006	0.67533833	0.67500168	0.67189574	0.66444778
211	0.85000038	0.61256415	0.60591358	0.60531151	0.59936768	0.58534724
216	0.90000057	0.52488202	0.51192468	0.51027840	0.49561709	0.47627842
221	0.94999981	0.39794564	0.34857339	0.34809530	0.34245515	0.33679563
226	1.00000000	0.0	0.15533352	0.15705961	0.17090666	0.19184643
231	1.05000019	0.0	0.02495673	0.02822281	0.05127633	0.08255070
236	1.10000038	0.0	0.00000000	0.00005500	0.00649588	0.02452280
241	1.15000057	0.0	0.0	0.00000000	0.00024205	0.00464528
246	1.19999981	0.0	0.0	0.00000000	0.00000201	0.00047491
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000149

I	OBSERVATIONAL LIMB DARKENING			BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.95518309	-0.96009165	-0.96016550	-0.96059656	-0.96143585
2	0.53342736	+/-	0.01091558	-0.90491033	-0.90956050	-0.90963048	-0.91003883	-0.91083395
3	0.65479004	+/-	0.00818945	-0.85463750	-0.85902935	-0.85909545	-0.85948110	-0.86023206
4	0.75611269	+/-	0.00561380	-0.80436474	-0.80849826	-0.80856043	-0.80892342	-0.80963022
5	0.78291219	+/-	0.00675163	-0.75409192	-0.75796711	-0.75802535	-0.75836569	-0.75902832
6	0.80480182	+/-	0.00797137	-0.70381910	-0.70743597	-0.70749032	-0.70780796	-0.70842642
7	0.82743675	+/-	0.00623813	-0.65354633	-0.65690482	-0.65695530	-0.65725023	-0.65782452
8	0.86624938	+/-	0.00318797	-0.60327351	-0.60637367	-0.60642028	-0.60669255	-0.60722262
9	0.87631249	+/-	0.00395660	-0.55300075	-0.55584252	-0.55588526	-0.55613482	-0.55662072
10	0.89928478	+/-	0.00349412	-0.50272793	-0.50531137	-0.50535023	-0.50557709	-0.50601888
11	0.92002296	+/-	0.00552572	-0.45245516	-0.45478022	-0.45481521	-0.45501941	-0.45541698
12	0.94750106	+/-	0.00550232	-0.40218234	-0.40424913	-0.40428019	-0.40446168	-0.40481508
13	0.97597575	+/-	0.00535607	-0.35190952	-0.35371798	-0.35374516	-0.35390395	-0.35421318
14	0.97354567	+/-	0.00519064	-0.30163676	-0.30318683	-0.30321014	-0.30334628	-0.30361128
15	0.97948796	+/-	0.00472198	-0.25136393	-0.25265568	-0.25267512	-0.25278854	-0.25300944
16	0.97610667	+/-	0.00377265	-0.20109117	-0.20212454	-0.20214009	-0.20223081	-0.20240754
17	0.98010772	+/-	0.00352922	-0.15081835	-0.15159339	-0.15160507	-0.15167314	-0.15180564
18	0.98225969	+/-	0.00415973	-0.10054559	-0.10106224	-0.10107005	-0.10111541	-0.10120374
19	0.98542905	+/-	0.00458061	-0.05027280	-0.05053114	-0.05053503	-0.05055771	-0.05060189
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05027280	0.05053114	0.05053503	0.05055771	0.05060189
22	0.98186535	+/-	0.00326987	0.10054559	0.10106224	0.10107005	0.10111541	0.10120374
23	0.98517853	+/-	0.00420680	0.15081835	0.15159339	0.15160507	0.15167314	0.15180564
24	0.97912860	+/-	0.00481493	0.20109117	0.20212454	0.20214009	0.20223081	0.20240754
25	0.97057939	+/-	0.00490139	0.25136393	0.25265568	0.25267512	0.25278854	0.25300944
26	0.96084350	+/-	0.00525466	0.30163676	0.30318683	0.30321014	0.30334628	0.30361128
27	0.94119048	+/-	0.00554555	0.35190952	0.35371798	0.35374516	0.35390395	0.35421318
28	0.91906935	+/-	0.00509574	0.40218234	0.40424913	0.40428019	0.40446168	0.40481508
29	0.91350764	+/-	0.00542074	0.45245516	0.45478022	0.45481521	0.45501941	0.45541698
30	0.89249408	+/-	0.00553969	0.50272793	0.50531137	0.50535023	0.50557709	0.50601888
31	0.85914189	+/-	0.00620985	0.55300075	0.55584252	0.55588526	0.55613482	0.55662072
32	0.84589475	+/-	0.00721151	0.60327351	0.60637367	0.60642028	0.60669255	0.60722262
33	0.81060582	+/-	0.00680591	0.65354633	0.65690482	0.65695530	0.65725023	0.65782452
34	0.78447413	+/-	0.00577597	0.70381910	0.70743597	0.70749032	0.70780796	0.70842642
35	0.73478526	+/-	0.00650398	0.75409192	0.75796711	0.75802535	0.75836569	0.75902832
36	0.68907928	+/-	0.00965067	0.80436474	0.80849826	0.80856043	0.80892342	0.80963022
37	0.63452137	+/-	0.00645271	0.85463750	0.85902935	0.85909545	0.85948110	0.86023206
38	0.48173147	+/-	0.00703276	0.90491033	0.90956050	0.90963048	0.91003883	0.91083395
39	0.24655521	+/-	0.00533949	0.95518309	0.96009165	0.96016550	0.96059656	0.96143585
40	0.0	+/-	0.0	1.00545502	1.01062202	1.01070023	1.01115417	1.01203728

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000276	0.00059077
11	-1.14999866	0.0	0.0	0.00000000	0.00031739	0.00559282
16	-1.09999847	0.0	0.00000000	0.00009424	0.00808791	0.02880231
21	-1.04999924	0.0	0.03205626	0.03559048	0.06089802	0.09466231
26	-0.99999928	0.0	0.17861921	0.18026549	0.19353092	0.21359599
31	-0.94999933	0.44474781	0.38461226	0.38384968	0.37549067	0.36604625
36	-0.89999932	0.56282288	0.55042577	0.54871535	0.53192556	0.50922626
41	-0.84999931	0.64353877	0.63734001	0.63677359	0.63102341	0.61625624
46	-0.79999930	0.70552045	0.70115119	0.70083874	0.69798785	0.69083744
51	-0.74999928	0.75467038	0.75191158	0.75169921	0.74985147	0.74587715
56	-0.69999933	0.79605287	0.79354435	0.79340434	0.79216319	0.78957051
61	-0.64999932	0.83015615	0.82852840	0.82843393	0.82760495	0.82585269
66	-0.59999931	0.85999531	0.85856968	0.85850483	0.85791481	0.85665172
71	-0.54999930	0.88618422	0.88465595	0.88459533	0.88407272	0.88305801
76	-0.49999928	0.90830445	0.90695626	0.90690863	0.90649575	0.90570760
81	-0.44999933	0.92696023	0.92589957	0.92587334	0.92562139	0.92509294
86	-0.39999932	0.94318652	0.94217885	0.94216275	0.94201362	0.94168371
91	-0.34999931	0.95716608	0.95619911	0.95618761	0.95608222	0.95586038
96	-0.29999930	0.96904182	0.96810704	0.96809912	0.96802193	0.96787065
101	-0.25000000	0.97892594	0.97801566	0.97801065	0.97795808	0.97785711
106	-0.19999981	0.98690552	0.98601300	0.98601049	0.98597986	0.98591584
111	-0.14999962	0.99304748	0.99216866	0.99216771	0.99214900	0.99211466
116	-0.09999943	0.99740100	0.99653172	0.99653149	0.99652326	0.99650609
121	-0.05000019	1.00000000	0.99913400	0.99913472	0.99913311	0.99912864
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99913418	0.99913454	0.99913311	0.99912900
136	0.10000038	0.99740106	0.99653172	0.99653155	0.99652499	0.99650651
141	0.15000057	0.99304754	0.99216849	0.99216765	0.99215275	0.99211508
146	0.19999981	0.98690557	0.98601365	0.98601055	0.98598021	0.98591560
151	0.25000000	0.97892594	0.97801566	0.97801018	0.97796017	0.97785693
156	0.30000019	0.96904194	0.96810704	0.96809924	0.96802503	0.96787208
161	0.35000038	0.95716619	0.95619994	0.95618784	0.95608121	0.95586097
166	0.40000057	0.94318664	0.94217974	0.94216305	0.94201499	0.94168264
171	0.44999981	0.92696035	0.92590046	0.92587340	0.92562211	0.92509294
176	0.50000000	0.90830445	0.90695727	0.90690887	0.90649539	0.90570903
181	0.55000019	0.88618463	0.88465679	0.88459617	0.88407373	0.88305944
186	0.60000038	0.85999560	0.85857075	0.85850590	0.85791785	0.85665250
191	0.65000057	0.83015645	0.82852888	0.82843477	0.82760596	0.82585412
196	0.69999981	0.79605305	0.79354453	0.79340506	0.79216355	0.78957051
201	0.75000000	0.75467038	0.75191325	0.75169992	0.74985182	0.74587739
206	0.80000019	0.70552123	0.70115185	0.70084071	0.69799024	0.69091094
211	0.85000038	0.64353955	0.63734215	0.63677579	0.63108486	0.61664832
216	0.90000057	0.56282371	0.55042881	0.54877925	0.53275180	0.51051331
221	0.94999981	0.44474840	0.38817513	0.38728237	0.37835115	0.36853784
226	1.00000000	0.0	0.17920631	0.18084568	0.19404525	0.21399653
231	1.05000019	0.0	0.03202475	0.03556003	0.06087290	0.09464121
236	1.10000038	0.0	0.00000000	0.00009455	0.00809209	0.02880871
241	1.15000057	0.0	0.0	0.00000000	0.00031868	0.00560126
246	1.19999981	0.0	0.0	0.00000000	0.00000282	0.00059550
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000314

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.96942884	-0.97583431	-0.97590315	-0.97631478	-0.97711354
2	0.53342736	+/-	0.01091558	-0.91840625	-0.92447460	-0.92453986	-0.92492980	-0.92568648
3	0.65479004	+/-	0.00818945	-0.86738366	-0.87311488	-0.87317652	-0.87354481	-0.87425947
4	0.75611269	+/-	0.00561380	-0.81636113	-0.82175523	-0.82181323	-0.82215983	-0.82283247
5	0.78291219	+/-	0.00675163	-0.76533854	-0.77039552	-0.77044988	-0.77077478	-0.77140540
6	0.80480182	+/-	0.00797137	-0.71431595	-0.71903580	-0.71908653	-0.71938980	-0.71997839
7	0.82743675	+/-	0.00623813	-0.66329336	-0.66767609	-0.66772324	-0.66800481	-0.66855133
8	0.86624938	+/-	0.00318797	-0.61227083	-0.61631638	-0.61635989	-0.61661983	-0.61712432
9	0.87631249	+/-	0.00395660	-0.56124824	-0.56495667	-0.56499654	-0.56523484	-0.56569731
10	0.89928478	+/-	0.00349412	-0.51022565	-0.51359701	-0.51363325	-0.51384985	-0.51427025
11	0.92002296	+/-	0.00552572	-0.45920312	-0.46223730	-0.46226990	-0.46246487	-0.46284324
12	0.94750106	+/-	0.00550232	-0.40818053	-0.41087759	-0.41090661	-0.41107988	-0.41141623
13	0.97597575	+/-	0.00535607	-0.35715795	-0.35951787	-0.35954326	-0.35969490	-0.35998917
14	0.97354567	+/-	0.00519064	-0.30613542	-0.30815816	-0.30817991	-0.30830991	-0.30856216
15	0.97948796	+/-	0.00472198	-0.25511283	-0.25679851	-0.25681663	-0.25692493	-0.25713509
16	0.97610867	+/-	0.00377265	-0.20409024	-0.20543879	-0.20545328	-0.20553994	-0.20570809
17	0.98010772	+/-	0.00352922	-0.15306771	-0.15407908	-0.15408993	-0.15415496	-0.15428108
18	0.98225969	+/-	0.00415973	-0.10204512	-0.10271937	-0.10272664	-0.10276997	-0.10285401
19	0.98542905	+/-	0.00458061	-0.05102257	-0.05135970	-0.05136333	-0.05138499	-0.05142703
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05102257	0.05135970	0.05136333	0.05138499	0.05142703
22	0.98186535	+/-	0.00326987	0.10204512	0.10271937	0.10272664	0.10276997	0.10285401
23	0.98517853	+/-	0.00420880	0.15306771	0.15407908	0.15408993	0.15415496	0.15428108
24	0.97912860	+/-	0.00481493	0.20409024	0.20543879	0.20545328	0.20553994	0.20570809
25	0.97057939	+/-	0.00490139	0.25511283	0.25679851	0.25681663	0.25692493	0.25713509
26	0.96084350	+/-	0.00525466	0.30613542	0.30815816	0.30817991	0.30830991	0.30856216
27	0.94119048	+/-	0.00554555	0.35715795	0.35951787	0.35954326	0.35969490	0.35998917
28	0.91906935	+/-	0.00509574	0.40818053	0.41087759	0.41090661	0.41107988	0.41141623
29	0.91350764	+/-	0.00542074	0.45920312	0.46223730	0.46226990	0.46246487	0.46284324
30	0.89249408	+/-	0.00553969	0.51022565	0.51359701	0.51363325	0.51384985	0.51427025
31	0.85914189	+/-	0.00620985	0.56124824	0.56495667	0.56499654	0.56523484	0.56569731
32	0.84589475	+/-	0.00721151	0.61227083	0.61631638	0.61635989	0.61661983	0.61712432
33	0.81060582	+/-	0.00680591	0.66329336	0.66767609	0.66772324	0.66800481	0.66855133
34	0.78447413	+/-	0.00577597	0.71431595	0.71903580	0.71908653	0.71938980	0.7199783
35	0.73478526	+/-	0.00650398	0.76533854	0.77039552	0.77044988	0.77077478	0.7714054
36	0.68907928	+/-	0.00965067	0.81636113	0.82175523	0.82181323	0.82215983	0.8228324
37	0.63452137	+/-	0.00845271	0.86738366	0.87311488	0.87317652	0.87354481	0.8742594
38	0.48173147	+/-	0.00703276	0.91840625	0.92447460	0.92453986	0.92492980	0.9256864
39	0.24655521	+/-	0.00533949	0.96942884	0.97583431	0.97590315	0.97631478	0.9771135
40	0.0	+/-	0.0	1.02045059	1.02719402	1.02726650	1.02769947	1.0285396

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000257	0.00055345
11	-1.14999866	0.0	0.0	0.00000000	0.00029644	0.00526859
16	-1.09999847	0.0	0.00000000	0.00008752	0.00758537	0.02725320
21	-1.04999924	0.0	0.02990329	0.03328227	0.05747542	0.09002423
26	-0.99999928	0.0	0.16918176	0.17084199	0.18418819	0.20440054
31	-0.94999933	0.42398429	0.36824244	0.36761701	0.36045200	0.35262644
36	-0.89999932	0.54500479	0.53266931	0.53102160	0.51515836	0.49395317
41	-0.84999931	0.62869841	0.62238562	0.62181574	0.61606789	0.60172927
46	-0.79999930	0.69332701	0.68877804	0.68845880	0.68551600	0.67829317
51	-0.74999928	0.74457103	0.74170339	0.74148381	0.73955423	0.73543489
56	-0.69999933	0.78772706	0.78512323	0.78498000	0.78367829	0.78097147
61	-0.64999932	0.82331681	0.82162386	0.82152748	0.82065451	0.81881803
66	-0.59999931	0.85445660	0.85297352	0.85290802	0.85228026	0.85094655
71	-0.54999930	0.88178700	0.88017970	0.88011837	0.87955534	0.87847650
76	-0.49999928	0.90481073	0.90339768	0.90334922	0.90290380	0.90206200
81	-0.44999933	0.92417729	0.92307776	0.92305416	0.92278218	0.92221946
86	-0.39999932	0.94102186	0.93997854	0.93996453	0.93980277	0.93945408
91	-0.34999931	0.95553410	0.95453221	0.95452070	0.95440614	0.95417625
96	-0.29999930	0.96786237	0.96689326	0.96688223	0.96680313	0.96664548
101	-0.25000000	0.97812301	0.97717857	0.97717339	0.97711891	0.97701156
106	-0.19999981	0.98640662	0.98548108	0.98547715	0.98544377	0.98537689
111	-0.14999962	0.99278265	0.99187154	0.99186832	0.99185097	0.99181283
116	-0.09999943	0.99730200	0.99640012	0.99639922	0.99639136	0.99637222
121	-0.05000019	1.00000000	0.99910253	0.99910045	0.99909920	0.99909538
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99910218	0.99910134	0.99909920	0.99909520
136	0.10000038	0.99730206	0.99640125	0.99640101	0.99638957	0.99637312
141	0.15000057	0.99278271	0.99187207	0.99186927	0.99185097	0.99181229
146	0.19999981	0.98640674	0.98548186	0.98547804	0.98544466	0.98537815
151	0.25000000	0.97812301	0.97717839	0.97717339	0.97711861	0.97701228
156	0.30000019	0.96786249	0.96689343	0.96688402	0.96680433	0.96664476
161	0.35000038	0.95553422	0.95453221	0.95452070	0.95440739	0.95417720
166	0.40000057	0.94102192	0.93997818	0.93996531	0.93980396	0.93945462
171	0.44999981	0.92417735	0.92307830	0.92305434	0.92278218	0.92222071
176	0.50000000	0.90481073	0.90339750	0.90334940	0.90290201	0.90206307
181	0.55000019	0.88178742	0.88018101	0.88011944	0.87955713	0.87847775
186	0.60000038	0.85445696	0.85297370	0.85290861	0.85228086	0.85094833
191	0.65000057	0.82331711	0.82162446	0.82152832	0.82065356	0.81882036
196	0.69999981	0.78772730	0.78512436	0.78498077	0.78368068	0.78097457
201	0.75000000	0.74457103	0.74170339	0.74148458	0.73955363	0.73543340
206	0.80000019	0.69332790	0.68878031	0.68846053	0.68551660	0.67836142
211	0.85000038	0.62869924	0.62238866	0.62181777	0.61612529	0.60209274
216	0.90000057	0.54500562	0.53267330	0.53108102	0.51592636	0.49514914
221	0.94999981	0.42398489	0.37155026	0.37080449	0.36310750	0.35494137
226	1.00000000	0.0	0.16972381	0.17137760	0.18466306	0.20476848
231	1.05000019	0.0	0.02987427	0.03325423	0.05745225	0.09000486
236	1.10000038	0.0	0.00000000	0.00008780	0.00758924	0.02725916
241	1.15000057	0.0	0.0	0.00000000	0.00029764	0.00527638
246	1.19999981	0.0	0.0	0.00000000	0.00000263	0.00055782
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000291

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.96280229	-0.96872395	-0.96879619	-0.96921444	-0.97003371
2	0.53342736	+/-	0.01091558	-0.91212845	-0.91773850	-0.91780692	-0.91820312	-0.91897929
3	0.65479004	+/-	0.00818945	-0.86145467	-0.86675304	-0.86681765	-0.86719185	-0.86792487
4	0.75611269	+/-	0.00561380	-0.81078088	-0.81576759	-0.81582838	-0.81618059	-0.81687051
5	0.78291219	+/-	0.00675163	-0.76010704	-0.76478207	-0.76483905	-0.76516926	-0.76581609
6	0.80480182	+/-	0.00797137	-0.70943326	-0.71379662	-0.71384978	-0.71415800	-0.71476167
7	0.82743675	+/-	0.00623813	-0.65875942	-0.66281116	-0.66286051	-0.66314667	-0.66370726
8	0.86624938	+/-	0.00318797	-0.60808563	-0.61182564	-0.61187124	-0.61213541	-0.61265284
9	0.87631249	+/-	0.00395660	-0.55741185	-0.56084019	-0.56088197	-0.56112415	-0.56159842
10	0.89928478	+/-	0.00349412	-0.50673801	-0.50985473	-0.50989270	-0.51011282	-0.51054406
11	0.92002296	+/-	0.00552572	-0.45606422	-0.45886922	-0.45890343	-0.45910156	-0.45948964
12	0.94750106	+/-	0.00550232	-0.40539044	-0.40788376	-0.40791416	-0.40809029	-0.40843523
13	0.97597575	+/-	0.00535607	-0.35471660	-0.35689831	-0.35692489	-0.35707897	-0.35738081
14	0.97354567	+/-	0.00519064	-0.30404282	-0.30591279	-0.30593562	-0.30606771	-0.30632639
15	0.97948796	+/-	0.00472198	-0.25336897	-0.25492734	-0.25494635	-0.25505638	-0.25527203
16	0.97610867	+/-	0.00377265	-0.20269519	-0.20394188	-0.20395708	-0.20404512	-0.20421761
17	0.98010772	+/-	0.00352922	-0.15202141	-0.15295637	-0.15296781	-0.15303385	-0.15316319
18	0.98225969	+/-	0.00415973	-0.10134757	-0.10197091	-0.10197854	-0.10202253	-0.10210878
19	0.98542905	+/-	0.00458061	-0.05067381	-0.05098547	-0.05098927	-0.05101129	-0.05105441
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05067381	0.05098547	0.05098927	0.05101129	0.05105441
22	0.98186535	+/-	0.00326987	0.10134757	0.10197091	0.10197854	0.10202253	0.10210878
23	0.98517853	+/-	0.00420880	0.15202141	0.15295637	0.15296781	0.15303385	0.15316319
24	0.97912860	+/-	0.00481493	0.20269519	0.20394188	0.20395708	0.20404512	0.20421761
25	0.97057939	+/-	0.00490139	0.25336897	0.25492734	0.25494635	0.25505638	0.25527203
26	0.96084350	+/-	0.00525466	0.30404282	0.30591279	0.30593562	0.30606771	0.30632639
27	0.94119048	+/-	0.00554555	0.35471660	0.35689831	0.35692489	0.35707897	0.35738081
28	0.91906935	+/-	0.00509574	0.40539044	0.40788376	0.40791416	0.40809029	0.40843523
29	0.91350764	+/-	0.00542074	0.45606422	0.45886922	0.45890343	0.45910156	0.45948964
30	0.89249408	+/-	0.00553969	0.50673801	0.50985473	0.50989270	0.51011282	0.51054406
31	0.85914189	+/-	0.00620985	0.55741185	0.56084019	0.56088197	0.56112415	0.56159842
32	0.84589475	+/-	0.00721151	0.60808563	0.61182564	0.61187124	0.61213541	0.61265284
33	0.81060582	+/-	0.00680591	0.65875942	0.66281116	0.66286051	0.66314667	0.66370726
34	0.78447413	+/-	0.00577597	0.70943326	0.71379662	0.71384978	0.71415800	0.71476167
35	0.73478526	+/-	0.00650398	0.76010704	0.76478207	0.76483905	0.76516926	0.76581609
36	0.68907928	+/-	0.00965067	0.81078088	0.81576759	0.81582838	0.81618059	0.81687051
37	0.63452137	+/-	0.00845271	0.86145467	0.86675304	0.86681765	0.86719185	0.86792487
38	0.48173147	+/-	0.00703276	0.91212845	0.91773850	0.91780692	0.91820312	0.91897929
39	0.24655521	+/-	0.00533949	0.96280229	0.96872395	0.96879619	0.96921444	0.97003371
40	0.0	+/-	0.0	1.01347542	1.01970863	1.01978493	1.02022552	1.02108765

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000258	0.00057762
11	-1.14999866	0.0	0.0	0.00000000	0.00030435	0.00553015
16	-1.09999847	0.0	0.00000000	0.00008106	0.00791807	0.02867795
21	-1.04999924	0.0	0.03117150	0.03479189	0.06052539	0.09477830
26	-0.99999928	0.0	0.17931974	0.18100870	0.19461352	0.21516252
31	-0.94999933	0.44973093	0.38833803	0.38758171	0.37921757	0.36973149
36	-0.89999932	0.56966054	0.55678278	0.55499953	0.53781140	0.51465762
41	-0.84999931	0.65087730	0.64450693	0.64392292	0.63794810	0.62274313
46	-0.79999930	0.71285093	0.70826072	0.70794225	0.70497906	0.69757634
51	-0.74999928	0.76133293	0.75855446	0.75833911	0.75641990	0.75230896
56	-0.69999933	0.80202198	0.79946458	0.79932761	0.79805416	0.79539591
61	-0.64999932	0.83523703	0.83364838	0.83355904	0.83272004	0.83095276
66	-0.59999931	0.86429906	0.86291146	0.86285347	0.86226660	0.86100793
71	-0.54999930	0.88980597	0.88829875	0.88824069	0.88772053	0.88671094
76	-0.49999928	0.91127932	0.90995508	0.90990949	0.90949589	0.90871334
81	-0.44999933	0.92932987	0.92830247	0.92827928	0.92803115	0.92750823
86	-0.39999932	0.94502968	0.94405383	0.94403780	0.94389468	0.94357336
91	-0.34999931	0.95855570	0.95762014	0.95761102	0.95750868	0.95729339
96	-0.29999930	0.97004622	0.96914136	0.96913433	0.96906340	0.96891451
101	-0.25000000	0.97960967	0.97872853	0.97872335	0.97867638	0.97857672
106	-0.19999981	0.98733032	0.98646700	0.98646718	0.98643470	0.98637241
111	-0.14999962	0.99327308	0.99242282	0.99242288	0.99240494	0.99237150
116	-0.09999943	0.99748528	0.99664384	0.99664652	0.99663603	0.99662149
121	-0.05000019	1.00000000	0.99916244	0.99916369	0.99916196	0.99915808
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99916244	0.99916530	0.99916142	0.99915791
136	0.10000038	0.99748546	0.99664450	0.99664730	0.99663657	0.99662066
141	0.15000057	0.99327314	0.99242383	0.99242532	0.99240434	0.99237150
146	0.19999981	0.98733038	0.98646700	0.98646802	0.98643470	0.98637271
151	0.25000000	0.97960967	0.97872907	0.97872335	0.97867417	0.97857720
156	0.30000019	0.97004634	0.96914220	0.96913517	0.96906173	0.96891516
161	0.35000038	0.95855588	0.95762050	0.95761019	0.95750785	0.95729637
166	0.40000057	0.94502980	0.94405502	0.94404191	0.94389439	0.94357318
171	0.44999981	0.92932987	0.92830300	0.92827845	0.92803037	0.92750907
176	0.50000000	0.91127932	0.90995508	0.90990698	0.90949452	0.90871382
181	0.55000019	0.88980633	0.88829964	0.88823986	0.88772029	0.88671261
186	0.60000038	0.86429936	0.86291176	0.86285424	0.86226851	0.86100912
191	0.65000057	0.83523732	0.83364928	0.83355981	0.83272165	0.83095276
196	0.69999981	0.80202210	0.79946542	0.79932845	0.79805529	0.79539770
201	0.75000000	0.76133293	0.75855517	0.75833970	0.75642020	0.75230861
206	0.80000019	0.71285170	0.70826226	0.70794398	0.70498204	0.69763541
211	0.85000036	0.65087807	0.64450949	0.64392495	0.63799793	0.62305653
216	0.90000057	0.56966132	0.55678594	0.55505061	0.53846610	0.51567745
221	0.94999981	0.44973153	0.39114034	0.39028251	0.38146812	0.37169296
226	1.00000000	0.0	0.17986298	0.18154550	0.19508958	0.21553129
231	1.05000019	0.0	0.03114169	0.03476311	0.06050166	0.09475851
236	1.10000038	0.0	0.00000000	0.00008135	0.00792206	0.02868410
241	1.15000057	0.0	0.0	0.00000000	0.00030558	0.00553814
246	1.19999981	0.0	0.0	0.00000000	0.00000264	0.00058204
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000250

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.97310317	-0.97937196	-0.97944474	-0.97984248	-0.98061454
2	0.53342736	+/-	0.01091558	-0.92188722	-0.92782611	-0.92789501	-0.92827183	-0.92900324
3	0.65479004	+/-	0.00818945	-0.87067127	-0.87628019	-0.87634528	-0.87670118	-0.87739193
4	0.75611269	+/-	0.00561380	-0.81945533	-0.82473433	-0.82479560	-0.82513052	-0.82578069
5	0.78291219	+/-	0.00675163	-0.76823932	-0.77318841	-0.77324587	-0.77355981	-0.77416939
6	0.80480182	+/-	0.00797137	-0.71702337	-0.72164249	-0.72169614	-0.72198915	-0.72255808
7	0.82743675	+/-	0.00623813	-0.66580743	-0.67009664	-0.67014641	-0.67041850	-0.67094678
8	0.86624938	+/-	0.00318797	-0.61459148	-0.61855072	-0.61859667	-0.61884785	-0.61933547
9	0.87631249	+/-	0.00395660	-0.56337553	-0.56700480	-0.56704694	-0.56727719	-0.56772417
10	0.89928478	+/-	0.00349412	-0.51215953	-0.51545894	-0.51549721	-0.51570654	-0.51611292
11	0.92002296	+/-	0.00552572	-0.46094358	-0.46391302	-0.46394747	-0.46413589	-0.46450162
12	0.94750106	+/-	0.00550232	-0.40972763	-0.41236717	-0.41239780	-0.41256523	-0.41289032
13	0.97597575	+/-	0.00535607	-0.35851169	-0.36082125	-0.36084807	-0.36099458	-0.36127901
14	0.97354567	+/-	0.00519064	-0.30729574	-0.30927533	-0.30929834	-0.30942392	-0.30966771
15	0.97948796	+/-	0.00472198	-0.25607973	-0.25772947	-0.25774860	-0.25785327	-0.25805646
16	0.97610667	+/-	0.00377265	-0.20486379	-0.20618355	-0.20619887	-0.20628262	-0.20644516
17	0.98010772	+/-	0.00352922	-0.15364784	-0.15463763	-0.15464914	-0.15471196	-0.15483385
18	0.98225969	+/-	0.00415973	-0.10243189	-0.10309178	-0.10309941	-0.10314131	-0.10322255
19	0.98542905	+/-	0.00458061	-0.05121596	-0.05154590	-0.05154973	-0.05157066	-0.05161129
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05121596	0.05154590	0.05154973	0.05157066	0.05161129
22	0.98186535	+/-	0.00326987	0.10243189	0.10309178	0.10309941	0.10314131	0.10322255
23	0.98517853	+/-	0.00420880	0.15364784	0.15463763	0.15464914	0.15471196	0.15483385
24	0.97912860	+/-	0.00481493	0.20486379	0.20618355	0.20619887	0.20628262	0.20644516
25	0.97057939	+/-	0.00490139	0.25607973	0.25772947	0.25774860	0.25785327	0.25805646
26	0.96084350	+/-	0.00525466	0.30729574	0.30927533	0.30929834	0.30942392	0.30966771
27	0.94119048	+/-	0.00554555	0.35851169	0.36082125	0.36084807	0.36099458	0.36127901
28	0.91906935	+/-	0.00509574	0.40972763	0.41236717	0.41239780	0.41256523	0.41289032
29	0.91350764	+/-	0.00542074	0.46094358	0.46391302	0.46394747	0.46413589	0.46450162
30	0.89249408	+/-	0.00553969	0.51215953	0.51545894	0.51549721	0.51570654	0.51611292
31	0.85914189	+/-	0.00620985	0.56337553	0.56700480	0.56704694	0.56727719	0.56772417
32	0.84589475	+/-	0.00721151	0.61459148	0.61855072	0.61859667	0.61884785	0.61933547
33	0.81060582	+/-	0.00680591	0.66580743	0.67009664	0.67014641	0.67041850	0.67094678
34	0.78447413	+/-	0.00577597	0.71702337	0.72164249	0.72169614	0.72198915	0.72255808
35	0.73478526	+/-	0.00650398	0.76823932	0.77318841	0.77324587	0.77355981	0.77416939
36	0.68907928	+/-	0.00965067	0.81945533	0.82473433	0.82479560	0.82513052	0.82578069
37	0.63452137	+/-	0.00845271	0.87067127	0.87628019	0.87634528	0.87670118	0.87739193
38	0.48173147	+/-	0.00703276	0.92188722	0.92782611	0.92789501	0.92827183	0.92900324
39	0.24655521	+/-	0.00533949	0.97310317	0.97937196	0.97944474	0.97984248	0.98061454
40	0.0	+/-	0.0	1.02431870	1.03091717	1.03099442	1.03141308	1.0322256

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999686	0.0	0.0	0.00000000	0.00000234	0.00053427
11	-1.14999866	0.0	0.0	0.00000000	0.00027875	0.00516608
16	-1.09999847	0.0	0.00000000	0.00007093	0.00733576	0.02698263
21	-1.04999924	0.0	0.02863061	0.03210535	0.05674956	0.08983088
26	-0.99999928	0.0	0.16932708	0.17104566	0.18485016	0.20569855
31	-0.94999933	0.42869681	0.37175953	0.37114900	0.36406136	0.35627824
36	-0.89999932	0.55258173	0.53946275	0.53771478	0.52136534	0.49962533
41	-0.84999931	0.63677633	0.63019931	0.62959671	0.62353420	0.60862398
46	-0.79999930	0.70109141	0.69632733	0.69599712	0.69293243	0.68541247
51	-0.74999928	0.75139099	0.74853778	0.74831575	0.74634159	0.74211252
56	-0.69999933	0.79369843	0.79110843	0.79096913	0.78966463	0.78693807
61	-0.64999932	0.82846016	0.82680565	0.82671022	0.82584512	0.82401770
66	-0.59999931	0.85887539	0.85742724	0.85736197	0.85674143	0.85541308
71	-0.54999930	0.88556993	0.88397074	0.88390827	0.88334292	0.88225877
76	-0.49999928	0.90794671	0.90654755	0.90649599	0.90604836	0.90520203
81	-0.44999933	0.92667538	0.92561120	0.92558467	0.92531836	0.92475879
86	-0.39999932	0.94296503	0.94195443	0.94193846	0.94178456	0.94144660
91	-0.34999931	0.95699912	0.95602906	0.95602077	0.95591003	0.95568740
96	-0.29999930	0.96892130	0.96798337	0.96797454	0.96789801	0.96774590
101	-0.25000000	0.97884405	0.97793078	0.97792637	0.97787333	0.97776955
106	-0.19999981	0.98685473	0.98595953	0.98595834	0.98592478	0.98585904
111	-0.14999962	0.99302065	0.99213946	0.99214071	0.99211758	0.99208349
116	-0.09999943	0.99739128	0.99651903	0.99651963	0.99651039	0.99649316
121	-0.05000019	1.000CC000	0.99913144	0.99913186	0.99912941	0.99912530
126	0.0	1.00000C00	1.00000CCC	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000CC0	0.99913C61	0.99913341	0.99913067	0.99912637
136	0.10000038	0.99739134	0.99651873	0.99652117	0.99651062	0.99649376
141	0.15000057	0.99302077	0.99213964	0.99213994	0.99212074	0.99208379
146	0.19999981	0.98685485	0.98595989	0.98595595	0.98592424	0.98586041
151	0.25000000	0.97884405	0.97793078	0.97792560	0.97787434	0.97777128
156	0.30000019	0.96892148	0.96798372	0.96797609	0.96790057	0.96774590
161	0.35000038	0.95699930	0.95602971	0.95601761	0.95591027	0.95568818
166	0.40000057	0.94296515	0.94195491	0.94194007	0.94178611	0.94144690
171	0.44999981	0.92667544	0.92561090	0.92558706	0.92531914	0.92475945
176	0.50000000	0.90794671	0.9065482C	0.90649599	0.90604860	0.90520173
181	0.55000019	0.88557035	0.88397187	0.88390982	0.88334191	0.88225865
186	0.60000038	0.85887569	C.85742724	0.85736197	0.85674167	0.85541308
191	0.65000057	0.82846040	0.82680595	0.82670945	0.82584667	0.82401955
196	0.69999981	0.79369861	0.79110944	0.79096985	0.78966671	0.78693992
201	0.75000000	0.75139099	0.74853808	0.74831629	0.74634314	0.74211270
206	0.80000019	0.70109224	0.69632912	0.69599891	0.69293398	0.68546206
211	0.85000038	0.63677716	0.63020128	0.62959880	0.62357593	0.60888934
216	0.90000057	0.55258262	0.53946638	0.53775847	0.52192014	0.50048745
221	0.94999981	0.42869747	0.37412536	0.37342858	0.36596066	0.35793447
226	1.00000000	0.0	0.16980833	0.17152089	0.18527204	0.20602554
231	1.05000019	0.0	0.02860412	0.03207973	0.05672847	0.08981335
236	1.10000038	C.0	0.0000000C	0.00007119	0.00733935	0.02698814
241	1.15000057	C.C	0.0	0.00000000	0.00027985	0.00517322
246	1.19999981	C.0	0.0	0.00000000	0.00000239	0.00053820
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000212

I	OBSERVATIONAL LIMB DARKENING	SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383 +/- 0.00996722	-0.96663994	-0.9723444C	-0.97241718	-0.97282314	-0.97361916
2	0.53342736 +/- 0.01091558	-0.91576415	-0.92116839	-0.92123729	-0.92162192	-0.92237604
3	0.65479004 +/- 0.00818945	-0.86488837	-0.86999238	-0.87005746	-0.87042069	-0.87113291
4	0.75611269 +/- 0.00561380	-0.81401259	-0.81881636	-0.81887764	-0.81921953	-0.81988984
5	0.78291219 +/- 0.00675163	-0.76313674	-0.76764029	-0.76769775	-0.76801831	-0.76864672
6	0.80480182 +/- 0.00797137	-0.71226096	-0.71646428	-0.71651793	-0.71681708	-0.71740359
7	0.82743675 +/- 0.00623813	-0.66138518	-0.66528827	-0.66533804	-0.66561586	-0.66616046
8	0.86624938 +/- 0.00318797	-0.61050940	-0.61411226	-0.61415821	-0.61441463	-0.61491734
9	0.87631249 +/- 0.00395660	-0.55963361	-0.56293625	-0.56297833	-0.56321341	-0.56367421
10	0.89928478 +/- 0.00349412	-0.50875783	-0.51176018	-0.51179850	-0.51201218	-0.51243114
11	0.92002296 +/- 0.00552572	-0.45788205	-0.46058416	-0.46061862	-0.46081096	-0.46118802
12	0.94750106 +/- 0.C0550232	-0.40700626	-0.40940815	-0.40943879	-0.40960974	-0.40994489
13	0.97597575 +/- 0.00535607	-0.35613048	-0.35823214	-0.35825896	-0.35840851	-0.35870177
14	0.97354567 +/- 0.C0519064	-0.30525470	-0.30705613	-0.30707908	-0.30720729	-0.30745864
15	0.97948796 +/- 0.00472198	-0.25437891	-0.25588C06	-0.25589925	-0.25600606	-0.25621557
16	0.97610867 +/- 0.00377265	-0.20350313	-0.20470405	-0.20471936	-0.20480484	-0.20497245
17	0.98010772 +/- 0.00352922	-0.15262735	-0.15352803	-0.15353954	-0.15360361	-0.15372932
18	0.98225969 +/- 0.00415973	-0.10175157	-0.10235202	-0.10235965	-0.10240239	-0.10248619
19	0.98542905 +/- 0.00458061	-0.05087579	-0.05117602	-0.05117985	-0.05120122	-0.05124312
20	1.00000000 +/- 0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104 +/- 0.00376810	0.05087579	0.05117602	0.05117985	0.05120122	0.05124312
22	0.98186535 +/- 0.00326987	0.10175157	0.10235202	0.10235965	0.10240239	0.10248619
23	0.98517853 +/- 0.00420880	0.15262735	0.15352803	0.15353954	0.15360361	0.15372932
24	0.97912860 +/- 0.00481493	0.20350313	0.20470405	0.20471936	0.20480484	0.20497245
25	0.97057939 +/- 0.00490139	0.25437891	0.25588006	0.25589925	0.25600606	0.25621557
26	0.96084350 +/- 0.00525466	0.30525470	0.30705613	0.30707908	0.30720729	0.30745864
27	0.94119048 +/- 0.00554555	0.35613048	0.35823214	0.35825896	0.35840851	0.35870177
28	0.91906935 +/- 0.00509574	0.40700626	0.40940815	0.40943879	0.40960974	0.40994489
29	0.91350764 +/- 0.0C542074	C.45788205	C.46058416	0.46061862	0.46081096	0.46118802
30	0.89249408 +/- 0.00553969	0.50875783	0.51176018	0.51179850	0.51201218	0.51243114
31	0.85914189 +/- 0.00620985	0.55963361	0.56293625	0.56297833	0.56321341	0.56367421
32	0.84589475 +/- 0.00721151	C.61050940	0.61411226	0.61415821	0.61441463	0.61491734
33	0.81060582 +/- 0.00680591	0.66138518	0.66528827	0.66533804	0.66561586	0.66616046
34	0.78447413 +/- 0.00577597	0.71226096	0.71646428	0.71651793	0.71681708	0.71740359
35	0.73478526 +/- 0.00650398	0.76313674	0.76764029	0.76769775	0.76801831	0.76864672
36	0.68907928 +/- 0.00965067	0.81401259	0.81881636	0.81887764	0.81921953	0.81988984
37	0.63452137 +/- 0.00845271	0.86488837	0.86999238	0.87005746	0.87042069	0.87113291
38	0.48173147 +/- 0.00703276	0.91576415	0.92116839	0.92123729	0.92162192	0.92237604
39	0.24655521 +/- 0.00533949	0.96663994	0.97234440	0.97241718	0.97282314	0.97361916
40	0.0 +/- 0.0	1.C1751518	1.02351952	1.02359676	1.02402401	1.02486229

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000333	0.00068078
11	-1.14999866	0.0	0.0	0.00000000	0.00037354	0.00632704
16	-1.09999847	0.0	0.00000000	0.00012151	0.00929243	0.03215892
21	-1.04999924	0.0	0.03733743	0.04111657	0.06837457	0.10433263
26	-0.99999928	0.0	0.19763225	0.19923741	0.21219879	0.23178309
31	-0.94999933	0.48383069	0.41612357	0.41510069	0.40443623	0.39192402
36	-0.89999932	0.59644848	0.58421677	0.58244646	0.56406832	0.53867364
41	-0.84999931	0.67234838	0.66635358	0.66580123	0.66005164	0.64453274
46	-0.79999930	0.73015535	0.72585708	0.72555763	0.72279656	0.71570820
51	-0.74999928	0.77534854	0.77278775	0.77258962	0.77083588	0.76705450
56	-0.69999933	0.81340516	0.81110060	0.81097519	0.80982620	0.80741072
61	-0.64999932	0.84478134	0.84328443	0.84319979	0.84243470	0.84081835
66	-0.59999931	0.87223434	0.87092251	0.87086552	0.87031269	0.86913836
71	-0.54999930	0.89632905	0.89489305	0.89483839	0.89433742	0.89338058
76	-0.49999928	0.91656798	0.91530967	0.91526628	0.91486776	0.91412288
81	-0.44999933	0.93354255	0.93257648	0.93255138	0.93231523	0.93182230
86	-0.39999932	0.94830656	0.94738930	0.94737315	0.94723773	0.94693798
91	-0.34999931	0.96102625	0.96014631	0.96013504	0.96003854	0.95984143
96	-0.29999930	0.97183180	0.97098142	0.97097075	0.97090411	0.97076923
101	-0.25000000	0.98082513	0.97999710	0.97999096	0.97994459	0.97985482
106	-0.19999981	0.98808563	0.98727411	0.98726815	0.98724079	0.98718482
111	-0.14999962	0.99367404	0.99287552	0.99287236	0.99285603	0.99282581
116	-0.09999943	0.99763519	0.99684578	0.99684423	0.99683654	0.99682236
121	-0.05000019	1.00000000	0.99921352	0.99921036	0.99921006	0.99920726
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99921334	0.99921125	0.99920976	0.99920815
136	0.10000038	0.99763530	0.99684602	0.99684334	0.99683565	0.99682254
141	0.15000057	0.99367410	0.99287570	0.99287236	0.99285603	0.99282670
146	0.19999981	0.98808569	0.98727453	0.98726815	0.98724169	0.98718536
151	0.25000000	0.98082513	0.97999674	0.97999096	0.97994488	0.97985500
156	0.30000019	0.97183198	0.97098184	0.97097164	0.97090441	0.97076941
161	0.35000038	0.96102637	0.96014649	0.96013325	0.96003854	0.95984215
166	0.40000057	0.94830662	0.94738966	0.94737226	0.94723892	0.94693869
171	0.44999981	0.93354261	0.93257684	0.93255317	0.93231553	0.93182248
176	0.50000000	0.91656798	0.91531008	0.91526681	0.91486949	0.91412252
181	0.55000019	0.89632940	0.89489448	0.89483905	0.89433712	0.89338094
186	0.60000038	0.87223464	0.87092322	0.87086630	0.87031358	0.86913925
191	0.65000057	0.84478164	0.84328443	0.84320039	0.84243590	0.84081978
196	0.69999981	0.81340539	0.81110096	0.81097591	0.80982679	0.80741215
201	0.75000000	0.77534854	0.77278888	0.77258980	0.77083677	0.76705217
206	0.80000019	0.73015606	0.72585917	0.72555912	0.72279865	0.71580523
211	0.85000038	0.67234915	0.66635484	0.66580331	0.66013581	0.64506519
216	0.90000057	0.59644932	0.58421993	0.58253223	0.56519413	0.54042697
221	0.94999981	0.48383129	0.42099524	0.41979462	0.40834856	0.39533174
226	1.00000000	0.0	0.19834048	0.19993722	0.21281880	0.23226410
231	1.05000019	0.0	0.03729990	0.04108030	0.06834465	0.10430747
236	1.10000038	0.0	0.00000000	0.00012187	0.00929736	0.03216651
241	1.15000057	0.0	0.0	0.00000000	0.00037508	0.00633707
246	1.19999981	0.0	0.0	0.00000000	0.00000340	0.00068645
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000425

I	OBSERVATIONAL LIMB DARKENING			BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.98292470	-0.99046773	-0.99053216	-0.99091655	-0.99165863
2	0.53342736	+/-	0.01091558	-0.93119180	-0.93833786	-0.93839890	-0.93876308	-0.93946606
3	0.65479004	+/-	0.00818945	-0.87945890	-0.88620800	-0.88626564	-0.88660955	-0.88727349
4	0.75611269	+/-	0.00561380	-0.82772607	-0.83407813	-0.83413237	-0.83445609	-0.83508098
5	0.78291219	+/-	0.00675163	-0.77599317	-0.78194821	-0.78199905	-0.78230256	-0.78288841
6	0.80480182	+/-	0.00797137	-0.72426027	-0.72981834	-0.72986579	-0.73014903	-0.73069584
7	0.82743675	+/-	0.00623813	-0.67252737	-0.67768848	-0.67773253	-0.67799556	-0.67850327
8	0.86624938	+/-	0.00318797	-0.62079453	-0.62555856	-0.62559927	-0.62584203	-0.62631071
9	0.87631249	+/-	0.00395660	-0.56906164	-0.57342869	-0.57346600	-0.57368851	-0.57411814
10	0.89928478	+/-	0.00349412	-0.51732874	-0.52129883	-0.52133268	-0.52153504	-0.52192557
11	0.92002296	+/-	0.00552572	-0.46559590	-0.46916890	-0.46919942	-0.46938151	-0.46973300
12	0.94750106	+/-	0.00550232	-0.41386300	-0.41703904	-0.41706616	-0.41722804	-0.41754049
13	0.97597575	+/-	0.00535607	-0.36213011	-0.36490917	-0.36493289	-0.36507452	-0.36534792
14	0.97354567	+/-	0.00519064	-0.31039727	-0.31277925	-0.31279963	-0.31292099	-0.31315535
15	0.97948796	+/-	0.00472198	-0.25866437	-0.26064938	-0.26066631	-0.26076752	-0.26096278
16	0.97610867	+/-	0.00377265	-0.20693147	-0.20851952	-0.20853305	-0.20861399	-0.20877022
17	0.98010772	+/-	0.00352922	-0.15519863	-0.15638959	-0.15639979	-0.15646046	-0.15657765
18	0.98225969	+/-	0.00415973	-0.10346574	-0.10425973	-0.10426652	-0.10430700	-0.10438508
19	0.98542905	+/-	0.00458061	-0.05173288	-0.05212988	-0.05213327	-0.05215351	-0.05219256
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05173288	0.05212988	0.05213327	0.05215351	0.05219256
22	0.98186535	+/-	0.00326987	0.10346574	0.10425973	0.10426652	0.10430700	0.10438508
23	0.98517853	+/-	0.00420880	0.15519863	0.15638959	0.15639979	0.15646046	0.15657765
24	0.97912860	+/-	0.00481493	0.20693147	0.20851952	0.20853305	0.20861399	0.20877022
25	0.97057939	+/-	0.00490139	0.25866437	0.26064938	0.26066631	0.26076752	0.26096278
26	0.96084350	+/-	0.00525466	0.31039727	0.31277925	0.31279963	0.31292099	0.31315535
27	0.94119048	+/-	0.00554555	0.36213011	0.36490917	0.36493289	0.36507452	0.36534792
28	0.91906935	+/-	0.00509574	0.41386300	0.41703904	0.41706616	0.41722804	0.41754049
29	0.91350764	+/-	0.00542074	0.46559590	0.46916890	0.46919942	0.46938151	0.46973300
30	0.89249408	+/-	0.00553969	0.51732874	0.52129883	0.52133268	0.52153504	0.52192557
31	0.85914189	+/-	0.00620985	0.56906164	0.57342869	0.57346600	0.57368851	0.57411814
32	0.84589475	+/-	0.00721151	0.62079453	0.62555856	0.62559927	0.62584203	0.6263107
33	0.81060582	+/-	0.00680591	0.67252737	0.67768848	0.67773253	0.67799556	0.6785032
34	0.78447413	+/-	0.00577597	0.72426027	0.72981834	0.72986579	0.73014903	0.7306958
35	0.73478526	+/-	0.00650398	0.77599317	0.78194821	0.78199905	0.78230256	0.7828884
36	0.68907928	+/-	0.00965067	0.82772607	0.83407813	0.83413237	0.83445609	0.8350809
37	0.63452137	+/-	0.00845271	0.87945890	0.88620800	0.88626564	0.88660955	0.8872734
38	0.48173147	+/-	0.00703276	0.93119180	0.93833786	0.93839890	0.93876308	0.9394660
39	0.24655521	+/-	0.00533949	0.98292470	0.99046773	0.99053216	0.99091655	0.9916586
40	0.0	+/-	0.0	1.03465748	1.04259682	1.04266453	1.04306984	1.0438509

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000299	0.00062393
11	-1.14999866	0.0	0.0	0.00000000	0.00033908	0.00585911
16	-1.09999847	0.0	0.00000000	0.00010651	0.00853185	0.03001136
21	-1.04999924	0.0	0.03399153	0.03760448	0.06357491	0.09815484
26	-0.99999928	0.0	0.18521941	0.18686920	0.20014501	0.22020710
31	-0.94999933	0.45844036	0.39601046	0.39517522	0.38613111	0.37578279
36	-0.89999932	0.57628113	0.56374729	0.56201118	0.54464233	0.52098793
41	-0.84999931	0.65629143	0.65003061	0.64945781	0.64358526	0.62838924
46	-0.79999930	0.71739900	0.71284926	0.71253556	0.70961583	0.70230997
51	-0.74999928	0.76513141	0.76240313	0.76219118	0.76030350	0.75626487
56	-0.69999933	0.80522466	0.80272973	0.80259544	0.80134666	0.79873872
61	-0.64999932	0.83803397	0.83646715	0.83637571	0.83555317	0.83381402
66	-0.59999931	0.86674106	0.86537111	0.86531061	0.86472696	0.86347318
71	-0.54999930	0.89193630	0.89042717	0.89036715	0.88983721	0.88881963
76	-0.49999928	0.91306287	0.91174203	0.91169232	0.91127330	0.91047889
81	-0.44999933	0.93075055	0.92974418	0.92971987	0.92947072	0.92894566
86	-0.39999932	0.94613481	0.94517964	0.94516468	0.94502157	0.94470292
91	-0.34999931	0.95938891	0.95847207	0.95846456	0.95835996	0.95815265
96	-0.29999930	0.97064847	0.96976191	0.96975529	0.96968251	0.96953893
101	-0.25000000	0.98001957	0.97915602	0.97915328	0.97910279	0.97900641
106	-0.19999981	0.98758507	0.98673934	0.98673785	0.98670554	0.98664671
111	-0.14999962	0.99340826	0.99257612	0.99257571	0.99255651	0.99252367
116	-0.09999943	0.99753588	0.99671239	0.99671334	0.99670339	0.99668831
121	-0.05000019	1.00000000	0.99917978	0.99918127	0.99917883	0.99917370
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99917996	0.99918205	0.99917859	0.99917400
136	0.10000038	0.99753600	0.99671203	0.99671173	0.99670362	0.99668914
141	0.15000057	0.99340838	0.99257630	0.99257338	0.99255729	0.99252367
146	0.19999981	0.98758519	0.98673964	0.98673785	0.98670685	0.98664623
151	0.25000000	0.98001957	0.97915602	0.97915328	0.97910440	0.97900659
156	0.30000019	0.97064859	0.96976173	0.96975529	0.96968275	0.96953970
161	0.35000038	0.95938903	0.95847291	0.95846218	0.95835894	0.95815188
166	0.40000057	0.94613487	0.94517982	0.94516629	0.94502133	0.94470340
171	0.44999981	0.93075061	0.92974389	0.92972142	0.92947203	0.92894578
176	0.50000000	0.91306287	0.91174269	0.91169548	0.91127282	0.91048062
181	0.55000019	0.89193678	0.89042699	0.89036715	0.88983959	0.88882011
186	0.60000038	0.86674136	0.86537260	0.86530983	0.86472875	0.86347383
191	0.65000057	0.83803427	0.83646864	0.83637655	0.83555681	0.83381641
196	0.69999981	0.80522484	0.80273008	0.80259603	0.80134821	0.79874045
201	0.75000000	0.76513141	0.76240396	0.76219183	0.76030433	0.75626361
206	0.80000019	0.71739978	0.71285123	0.71253711	0.70962000	0.70239383
211	0.85000038	0.65629220	0.65003294	0.64945966	0.64365524	0.62884766
216	0.90000057	0.57628191	0.56374943	0.56208563	0.54561257	0.52249640
221	0.94999981	0.45844102	0.40019965	0.39921165	0.38949478	0.37871337
226	1.00000000	0.0	0.18585217	0.18749475	0.20069963	0.22063780
231	1.05000019	0.0	0.03395788	0.03757197	0.06354809	0.09813237
236	1.10000038	0.0	0.00000000	0.00010684	0.00853630	0.03001823
241	1.15000057	0.0	0.0	0.00000000	0.00034047	0.00586812
246	1.19999981	0.0	0.0	0.00000000	0.00000306	0.00062900
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000367

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.97579765	-0.98260534	-0.98267365	-0.98306298	-0.98382843
2	0.53342736	+/-	0.01091558	-0.92443985	-0.93088925	-0.93095398	-0.93132281	-0.93204796
3	0.65479004	+/-	0.00818945	-0.87308210	-0.87917316	-0.87923431	-0.87958264	-0.88026750
4	0.75611269	+/-	0.00561380	-0.82172436	-0.82745713	-0.82751465	-0.82784253	-0.82848710
5	0.78291219	+/-	0.00675163	-0.77036655	-0.77574104	-0.77579498	-0.77610236	-0.77670664
6	0.80480182	+/-	0.00797137	-0.71900880	-0.72402495	-0.72407532	-0.72436219	-0.72492617
7	0.82743675	+/-	0.00623813	-0.66765100	-0.67230886	-0.67235565	-0.67262203	-0.67314571
8	0.86624938	+/-	0.00318797	-0.61629325	-0.62059283	-0.62063599	-0.62088186	-0.62136531
9	0.87631249	+/-	0.00395660	-0.56493545	-0.56887674	-0.56891632	-0.56914169	-0.56958485
10	0.89928478	+/-	0.00349412	-0.51357770	-0.51716065	-0.51719666	-0.51740158	-0.51780438
11	0.92002296	+/-	0.00552572	-0.46221989	-0.46544462	-0.46547699	-0.46566141	-0.46602398
12	0.94750106	+/-	0.00550232	-0.41086215	-0.41372854	-0.41375732	-0.41392124	-0.41424352
13	0.97597575	+/-	0.00535607	-0.35950440	-0.36201245	-0.36203766	-0.36218107	-0.36246306
14	0.97354567	+/-	0.00519064	-0.30814660	-0.31029642	-0.31031799	-0.31044090	-0.31068265
15	0.97948796	+/-	0.00472198	-0.25678885	-0.25858033	-0.25859833	-0.25870079	-0.25890219
16	0.97610867	+/-	0.00377265	-0.20543104	-0.20686424	-0.20687866	-0.20696062	-0.20712173
17	0.98010772	+/-	0.00352922	-0.15407330	-0.15514821	-0.15515900	-0.15522045	-0.15534133
18	0.98225969	+/-	0.00415973	-0.10271549	-0.10343212	-0.10343933	-0.10348028	-0.10356086
19	0.98542905	+/-	0.00458061	-0.05135777	-0.05171607	-0.05171967	-0.05174016	-0.05178044
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376610	0.05135777	0.05171607	0.05171967	0.05174016	0.05178044
22	0.98186535	+/-	0.00326987	0.10271549	0.10343212	0.10343933	0.10348028	0.10356086
23	0.98517853	+/-	0.00420880	0.15407330	0.15514821	0.15515900	0.15522045	0.15534133
24	0.97912860	+/-	0.00481493	0.20543104	0.20686424	0.20687866	0.20696062	0.20712173
25	0.97057939	+/-	0.00490139	0.25678885	0.25858033	0.25859833	0.25870079	0.25890219
26	0.96084350	+/-	0.00525466	0.30814660	0.31029642	0.31031799	0.31044090	0.31068265
27	0.94119048	+/-	0.00554555	0.35950440	0.36201245	0.36203766	0.36218107	0.36246306
28	0.91906935	+/-	0.00509574	0.41086215	0.41372854	0.41375732	0.41392124	0.41424352
29	0.91350764	+/-	0.00542074	0.46221989	0.46544462	0.46547699	0.46566141	0.46602398
30	0.89249408	+/-	0.00553969	0.51357770	0.51716065	0.51719666	0.51740158	0.51780438
31	0.85914189	+/-	0.00620985	0.56493545	0.56887674	0.56891632	0.56914169	0.56958485
32	0.84589475	+/-	0.00721151	0.61629325	0.62059283	0.62063599	0.62088186	0.62136531
33	0.81060582	+/-	0.00680591	0.66765100	0.67230886	0.67235565	0.67262203	0.67314571
34	0.78447413	+/-	0.00577597	0.71900880	0.72402495	0.72407532	0.72436219	0.72492617
35	0.73478526	+/-	0.00650398	0.77036655	0.77574104	0.77579498	0.77610236	0.77670664
36	0.68907928	+/-	0.00965067	0.82172436	0.82745713	0.82751465	0.82784253	0.82848710
37	0.63452137	+/-	0.00845271	0.87308210	0.87917316	0.87923431	0.87958264	0.88026750
38	0.48173147	+/-	0.00703276	0.92443985	0.93088925	0.93095398	0.93132281	0.93204796
39	0.24655521	+/-	0.00533949	0.97579765	0.98260534	0.98267365	0.98306298	0.98382843
40	0.0	+/-	0.0	1.02715492	1.03432083	1.03439331	1.03480244	1.03560829

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000309	0.00065893
11	-1.14999866	0.0	0.0	0.00000000	0.00035519	0.00619257
16	-1.09999847	0.0	0.00000000	0.00010564	0.00900838	0.03169934
21	-1.04999924	0.0	0.03597469	0.03980801	0.06726724	0.10345328
26	-0.99999928	0.0	0.19638038	0.19802707	0.21132320	0.23138666
31	-0.94999933	0.48438603	0.41640770	0.41541195	0.40496176	0.39270192
36	-0.89999932	0.59925449	0.58656621	0.58473635	0.56617153	0.54063976
41	-0.84999931	0.67603636	0.66987592	0.66930372	0.66336775	0.64754570
46	-0.79999930	0.73421729	0.72976917	0.72946042	0.72660571	0.71929568
51	-0.74999928	0.77933514	0.77672738	0.77651972	0.77469671	0.77076870
56	-0.69999933	0.81717706	0.81478095	0.81464636	0.81345797	0.81095248
61	-0.64999932	0.84801090	0.84653538	0.84644508	0.84567016	0.84401250
66	-0.59999931	0.87498945	0.87370169	0.87363935	0.87309599	0.87191111
71	-0.54999930	0.89866775	0.89724141	0.89718109	0.89668518	0.89572680
76	-0.49999928	0.91849804	0.91725242	0.91720301	0.91680902	0.91606182
81	-0.44999933	0.93507993	0.93413574	0.93410879	0.93387944	0.93338549
86	-0.39999932	0.94950247	0.94860619	0.94859052	0.94846004	0.94816273
91	-0.34999931	0.96192795	0.96106863	0.96105421	0.96096325	0.96077091
96	-0.29999930	0.97248268	0.97165161	0.97164214	0.97157699	0.97144580
101	-0.25000000	0.98126823	0.98045939	0.98045111	0.98040968	0.98032111
106	-0.19999981	0.98836076	0.98756874	0.98756164	0.98753703	0.98748165
111	-0.14999962	0.99382025	0.99304014	0.99303472	0.99302316	0.99299252
116	-0.09999943	0.99768937	0.99691820	0.99691367	0.99691051	0.99689591
121	-0.05000019	1.00000000	0.99923122	0.99923044	0.99923062	0.99922562
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99923110	0.99922746	0.99923092	0.99922621
136	0.10000038	0.99769026	0.99691790	0.99691516	0.99691004	0.99689651
141	0.15000057	0.99382025	0.99304014	0.99303699	0.99302316	0.99299252
146	0.19999981	0.98836076	0.98756921	0.98756385	0.98753953	0.98748255
151	0.25000000	0.98126823	0.98045975	0.98045039	0.98041016	0.98032081
156	0.30000019	0.97248363	0.97165275	0.97164214	0.97157848	0.97144657
161	0.35000038	0.96192795	0.96106803	0.96105421	0.96096450	0.96077168
166	0.40000057	0.94950253	0.94860649	0.94858980	0.94846034	0.94816321
171	0.44999981	0.93507999	0.93413526	0.93410879	0.93388045	0.93338650
176	0.50000000	0.91849804	0.91725224	0.91720301	0.91681027	0.91606170
181	0.55000019	0.89866805	0.89724237	0.89717960	0.89668715	0.89572841
186	0.60000038	0.87498975	0.87370187	0.87364006	0.87309551	0.87191141
191	0.65000057	0.84801114	0.84653616	0.84644508	0.84567064	0.84401327
196	0.69999981	0.81717724	0.81478202	0.81464857	0.81345946	0.81095415
201	0.75000000	0.77933514	0.77672768	0.77652049	0.77469921	0.77076674
206	0.80000019	0.73421806	0.72977149	0.72946185	0.72660720	0.71937656
211	0.85000038	0.67603713	0.66987932	0.66930532	0.66343606	0.64798391
216	0.90000057	0.59925526	0.58656853	0.58480740	0.56709564	0.54207557
221	0.94999981	0.48438662	0.42038018	0.41923970	0.40815085	0.39548117
226	1.00000000	0.0	0.19704908	0.19868791	0.21190888	0.23184085
231	1.05000019	0.0	0.03593862	0.03977317	0.06723851	0.10342908
236	1.10000038	0.0	0.00000000	0.00010599	0.00901314	0.03170665
241	1.15000057	0.0	0.0	0.00000000	0.00035667	0.00620220
246	1.19999981	0.0	0.0	0.00000000	0.00000316	0.00066432
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000350

I	OBSERVATIONAL LIMB DARKENING			BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	±	0.00996722	-0.98492432	-0.99223191	-0.99229628	-0.99267513	-0.99339944
2	0.53342736	±	0.01091558	-0.93308616	-0.94000918	-0.94007015	-0.94042903	-0.94111526
3	0.65479004	±	0.00818945	-0.88124806	-0.88778645	-0.88784403	-0.88818300	-0.88883108
4	0.75611269	±	0.00561380	-0.82940996	-0.83556372	-0.83561796	-0.83593696	-0.83654690
5	0.78291219	±	0.00675163	-0.77757180	-0.78334093	-0.78339183	-0.78369087	-0.78426272
6	0.80480182	±	0.00797137	-0.72573370	-0.73111820	-0.73116571	-0.73144484	-0.73197854
7	0.82743675	±	0.00623813	-0.67389554	-0.67889547	-0.67893958	-0.67919874	-0.67969435
8	0.86624938	±	0.00318797	-0.62205744	-0.62667274	-0.62671345	-0.62695271	-0.62741017
9	0.87631249	±	0.00395660	-0.57021934	-0.57445002	-0.57448733	-0.57470661	-0.57512599
10	0.89928478	±	0.00349412	-0.51838118	-0.52222729	-0.52226120	-0.52246058	-0.52284181
11	0.92002296	±	0.00552572	-0.46654308	-0.47000456	-0.47003508	-0.47021449	-0.47055763
12	0.94750106	±	0.00550232	-0.41470498	-0.41778183	-0.41780895	-0.41796845	-0.41827345
13	0.97597575	±	0.00535607	-0.36286682	-0.36555910	-0.36558282	-0.36572242	-0.36598927
14	0.97354567	±	0.00519064	-0.31102872	-0.31333637	-0.31335670	-0.31347632	-0.31370509
15	0.97948796	±	0.00472198	-0.25919056	-0.26111364	-0.26113057	-0.26123029	-0.26142091
16	0.97610867	±	0.00377265	-0.20735246	-0.20889091	-0.20890445	-0.20898420	-0.20913672
17	0.98010772	±	0.00352922	-0.15551436	-0.15666819	-0.15667832	-0.15673816	-0.15685254
18	0.98225969	±	0.00415973	-0.10367620	-0.10444546	-0.10445219	-0.10449207	-0.10456836
19	0.98542905	±	0.00458061	-0.05183812	-0.05222273	-0.05222612	-0.05224606	-0.05228418
20	1.00000000	±	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	±	0.00376810	0.05183812	0.05222273	0.05222612	0.05224606	0.05228418
22	0.98186535	±	0.00326987	0.10367620	0.10444546	0.10445219	0.10449207	0.10456836
23	0.98517853	±	0.00420880	0.15551436	0.15666819	0.15667832	0.15673816	0.15685254
24	0.97912860	±	0.00481493	0.20735246	0.20889091	0.20890445	0.20898420	0.20913672
25	0.97057939	±	0.00490139	0.25919056	0.26111364	0.26113057	0.26123029	0.26142091
26	0.96084350	±	0.00525466	0.31102872	0.31333637	0.31335670	0.31347632	0.31370509
27	0.94119048	±	0.00554555	0.36286682	0.36555910	0.36558282	0.36572242	0.36598927
28	0.91906935	±	0.00509574	0.41470498	0.41778183	0.41780895	0.41796845	0.41827345
29	0.91350764	±	0.00542074	0.46654308	0.47000456	0.47003508	0.47021449	0.47055763
30	0.89249408	±	0.00553969	0.51838118	0.52222729	0.52226120	0.52246058	0.52284181
31	0.85914189	±	0.00620985	0.57021934	0.57445002	0.57448733	0.57470661	0.57512599
32	0.84589475	±	0.00721151	0.62205744	0.62667274	0.62671345	0.62695271	0.62741017
33	0.81060582	±	0.00680591	0.67389554	0.67889547	0.67893958	0.67919874	0.67969435
34	0.78447413	±	0.00577597	0.72573370	0.73111820	0.73116571	0.73144484	0.73197854
35	0.73478526	±	0.00650398	0.77757180	0.78334093	0.78339183	0.78369087	0.78426272
36	0.68907928	±	0.00965067	0.82940996	0.83556372	0.83561796	0.83593696	0.83654690
37	0.63452137	±	0.00845271	0.88124806	0.88778645	0.88784403	0.88818300	0.88883108
38	0.48173147	±	0.00703276	0.93308616	0.94000918	0.94007015	0.94042903	0.94111526
39	0.24655521	±	0.00533949	0.98492432	0.99223191	0.99229628	0.99267513	0.99339944
40	0.0	±	0.0	1.03676224	1.04445457	1.04452229	1.04492092	1.04568291

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000273	0.00059989
11	-1.14999866	0.0	0.0	0.00000000	0.00031858	0.00571411
16	-1.09999847	0.0	0.00000000	0.00008861	0.00821855	0.02953156
21	-1.04999924	0.0	0.03246823	0.03615191	0.06240240	0.09730172
26	-0.99999928	0.0	0.18409270	0.18579197	0.19946796	0.22009653
31	-0.94999933	0.45999318	0.39697754	0.39616877	0.38732767	0.37720168
36	-0.89999932	0.58037984	0.56724107	0.56542528	0.54776222	0.52384514
41	-0.84999931	0.66113859	0.65466398	0.65406352	0.64794481	0.63234258
46	-0.79999930	0.72233945	0.71760160	0.71727490	0.71425039	0.70669341
51	-0.74999928	0.76960719	0.76686543	0.76664191	0.76470768	0.76055002
56	-0.69999933	0.80923045	0.80670893	0.80656737	0.80530643	0.80265510
61	-0.64999932	0.84146267	0.83992213	0.83982521	0.83900607	0.83725643
66	-0.59999931	0.86966485	0.86831945	0.86825764	0.86767983	0.86642867
71	-0.54999930	0.89441699	0.89291751	0.89285761	0.89232624	0.89131069
76	-0.49999928	0.91510952	0.91380113	0.91375345	0.91332984	0.91253769
81	-0.44999933	0.93238044	0.93139690	0.93137217	0.93112439	0.93060398
86	-0.39999932	0.94740272	0.94646955	0.94645381	0.94631457	0.94600332
91	-0.34999931	0.96034473	0.95944971	0.95943600	0.95933801	0.95913815
96	-0.29999930	0.97133970	0.97047317	0.97046530	0.97039580	0.97025722
101	-0.25000000	0.98048985	0.97964656	0.97964185	0.97959238	0.97950208
106	-0.19999981	0.98787767	0.98705137	0.98704809	0.98701817	0.98696011
111	-0.14999962	0.99356419	0.99275017	0.99274951	0.99273211	0.99270070
116	-0.09999943	0.99759406	0.99678987	0.99678701	0.99678081	0.99676728
121	-0.05000019	1.00000000	0.99919850	0.99919724	0.99919719	0.99919337
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99919909	0.99919939	0.99919486	0.99919325
136	0.10000038	0.99759406	0.99679005	0.99678981	0.99678016	0.99676728
141	0.15000057	0.99356419	0.99275106	0.99274737	0.99273139	0.99270070
146	0.19999981	0.98787767	0.98705226	0.98704737	0.98701817	0.98696101
151	0.25000000	0.98048985	0.97964686	0.97963905	0.97959471	0.97950238
156	0.30000019	0.97133970	0.97047418	0.97046745	0.97039604	0.97025734
161	0.35000038	0.96034473	0.95944971	0.95943815	0.95933872	0.95913774
166	0.40000057	0.94740272	0.94646955	0.94645452	0.94631481	0.94600415
171	0.44999981	0.93238044	0.93139762	0.93137145	0.93112510	0.93060565
176	0.50000000	0.91510952	0.91380125	0.91375059	0.91333103	0.91253799
181	0.55000019	0.89441735	0.89291799	0.89285481	0.89232838	0.89131224
186	0.60000038	0.86966509	0.86832035	0.86825901	0.86767960	0.86642849
191	0.65000057	0.84146297	0.83992243	0.83982801	0.83900470	0.83725691
196	0.69999981	0.80923057	0.80671024	0.80656737	0.80530834	0.80265605
201	0.75000000	0.76960719	0.76686645	0.76664543	0.76470768	0.76054978
206	0.80000019	0.72234023	0.71760261	0.71727663	0.71425223	0.70675993
211	0.85000038	0.66113943	0.65466660	0.65406555	0.64799982	0.63269418
216	0.90000057	0.58038062	0.56724459	0.56548274	0.54850394	0.52499771
221	0.94999981	0.45999384	0.40015572	0.39923096	0.38987935	0.37942523
226	1.00000000	0.0	0.18467230	0.18636531	0.19997621	0.22049052
231	1.05000019	0.0	0.03243668	0.03612142	0.06237728	0.09728068
236	1.10000038	0.0	0.00000000	0.00008892	0.00822277	0.02953804
241	1.15000057	0.0	0.0	0.00000000	0.00031988	0.00572257
246	1.19999981	0.0	0.0	0.00000000	0.00000279	0.00060459
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000282

I	OBSERVATIONAL LIMB DARKENING	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383 +/- 0.00996722	-0.97814614	-0.98468655	-0.98475379	-0.98513764	-0.98588580
2	0.53342736 +/- 0.01091558	-0.92666477	-0.93286091	-0.93292463	-0.93328828	-0.93399704
3	0.65479004 +/- 0.00818945	-0.87518340	-0.88103533	-0.88109547	-0.88143891	-0.88210833
4	0.75611269 +/- 0.00561380	-0.82370204	-0.82920974	-0.82926637	-0.82958961	-0.83021963
5	0.78291219 +/- 0.00675163	-0.77222061	-0.77738410	-0.77743721	-0.77774024	-0.77833086
6	0.80480182 +/- 0.00797137	-0.72073925	-0.72555852	-0.72560805	-0.72589087	-0.72644216
7	0.82743675 +/- 0.00623813	-0.66925788	-0.67373288	-0.67377889	-0.67404151	-0.67455339
8	0.86624938 +/- 0.00318797	-0.61777651	-0.62190729	-0.62194973	-0.62219220	-0.62266469
9	0.87631249 +/- 0.00395660	-0.56629515	-0.57008165	-0.57012057	-0.57034284	-0.57077599
10	0.89928478 +/- 0.00349412	-0.51481372	-0.51825607	-0.51829147	-0.51849347	-0.51888722
11	0.92002296 +/- 0.00552572	-0.46333236	-0.46643043	-0.46646231	-0.46664411	-0.46699852
12	0.94750106 +/- 0.00550232	-0.41185099	-0.41460484	-0.41463315	-0.41479480	-0.41510981
13	0.97597575 +/- 0.00535607	-0.36036962	-0.36277926	-0.36280400	-0.36294544	-0.36322105
14	0.97354567 +/- 0.00519064	-0.30888826	-0.31095362	-0.31097484	-0.31109607	-0.31133235
15	0.97948796 +/- 0.00472198	-0.25740683	-0.25912803	-0.25914574	-0.25924671	-0.25944358
16	0.97610867 +/- 0.00377265	-0.20592546	-0.20730239	-0.20731658	-0.20739740	-0.20755488
17	0.98010772 +/- 0.00352922	-0.15444410	-0.15547681	-0.15548742	-0.15554804	-0.15566617
18	0.98225969 +/- 0.00415973	-0.10296273	-0.10365117	-0.10365826	-0.10369867	-0.10377741
19	0.98542905 +/- 0.00458061	-0.05148138	-0.05182561	-0.05182915	-0.05184935	-0.05188873
20	1.00000000 +/- 0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104 +/- 0.00376810	0.05148138	0.05182561	0.05182915	0.05184935	0.05188873
22	0.98186535 +/- 0.00326987	0.10296273	0.10365117	0.10365826	0.10369867	0.10377741
23	0.98517853 +/- 0.00420880	0.15444410	0.15547681	0.15548742	0.15554804	0.15566617
24	0.97912860 +/- 0.00481493	0.20592546	0.20730239	0.20731658	0.20739740	0.20755488
25	0.97057939 +/- 0.00490139	0.25740683	0.25912803	0.25914574	0.25924671	0.25944358
26	0.96084350 +/- 0.00525466	0.30888826	0.31095362	0.31097484	0.31109607	0.31133235
27	0.94119048 +/- 0.00554555	0.36036962	0.36277926	0.36280400	0.36294544	0.36322105
28	0.91906935 +/- 0.00509574	0.41185099	0.41460484	0.41463315	0.41479480	0.41510981
29	0.91350764 +/- 0.00542074	0.46333236	0.46643043	0.46646231	0.46664411	0.46699852
30	0.89249408 +/- 0.00553969	0.51481372	0.51825607	0.51829147	0.51849347	0.51888722
31	0.85914189 +/- 0.00620985	0.56629515	0.57008165	0.57012057	0.57034284	0.57077599
32	0.84589475 +/- 0.00721151	0.61777651	0.62190729	0.62194973	0.62219220	0.62266469
33	0.81060582 +/- 0.00680591	0.66925788	0.67373288	0.67377889	0.67404151	0.67455339
34	0.78447413 +/- 0.00577597	0.72073925	0.72555852	0.72560805	0.72589087	0.72644216
35	0.73478526 +/- 0.00650398	0.77222061	0.77738410	0.77743721	0.77774024	0.77833086
36	0.68907928 +/- 0.00965067	0.82370204	0.82920974	0.82926637	0.82958961	0.83021963
37	0.63452137 +/- 0.00845271	0.87518340	0.88103533	0.88109547	0.88143891	0.88210833
38	0.48173147 +/- 0.00703276	0.92666477	0.93286091	0.93292463	0.93328828	0.93399704
39	0.24655521 +/- 0.00533949	0.97814614	0.98468655	0.98475379	0.98513764	0.98588580
40	0.0 +/- 0.0	1.02962685	1.03651142	1.03658295	1.03698635	1.03777409

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000405	0.00078637
11	-1.14999866	0.0	0.0	0.00000000	0.00044190	0.00716385
16	-1.09999847	0.0	0.00000000	0.00015850	0.01069818	0.03590288
21	-1.04999924	0.0	0.04355674	0.04756259	0.07675177	0.11489576
26	-0.99999928	0.0	0.21812922	0.21967405	0.23217356	0.25104946
31	-0.94999933	0.52432507	0.44898140	0.44767720	0.43453139	0.41873866
36	-0.89999932	0.63054860	0.61870027	0.61689764	0.59697068	0.56885850
41	-0.84999931	0.70131481	0.69561458	0.69508719	0.68943459	0.67327881
46	-0.79999930	0.75488633	0.75078994	0.75050938	0.74787831	0.74092191
51	-0.74999928	0.79644710	0.79404557	0.79385877	0.79218704	0.78858328
56	-0.69999933	0.83132339	0.82912362	0.82900500	0.82791513	0.82562494
61	-0.64999932	0.85978377	0.85841930	0.85833716	0.85762578	0.85611242
66	-0.59999931	0.88468564	0.88349384	0.88343889	0.88293630	0.88185161
71	-0.54999930	0.90654123	0.90522069	0.90516806	0.90470803	0.90382606
76	-0.49999928	0.92483717	0.92368388	0.92364150	0.92327559	0.92258859
81	-0.44999933	0.94012946	0.93925667	0.93923599	0.93902135	0.93856889
86	-0.39999932	0.95343024	0.95260245	0.95259219	0.95246708	0.95219713
91	-0.34999931	0.96488935	0.96409523	0.96408701	0.96399981	0.96382380
96	-0.29999930	0.97462404	0.97385681	0.97385192	0.97378916	0.97366738
101	-0.25000000	0.98272610	0.98197865	0.98197728	0.98193395	0.98185229
106	-0.19999981	0.98926699	0.98853552	0.98853552	0.98850614	0.98845583
111	-0.14999962	0.99430162	0.99358153	0.99358189	0.99356639	0.99353695
116	-0.09999943	0.99787003	0.99715728	0.99715763	0.99715066	0.99713707
121	-0.05000019	1.00000000	0.99929070	0.99929154	0.99928844	0.99928635
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99929118	0.99929386	0.99928844	0.99928588
136	0.10000038	0.99787003	0.99715811	0.99715680	0.99715042	0.99713784
141	0.15000057	0.99430168	0.99358118	0.99358267	0.99356538	0.99353772
146	0.19999981	0.98926711	0.98853570	0.98853552	0.98850590	0.98845565
151	0.25000000	0.98272610	0.98197961	0.98197651	0.98193371	0.98185229
156	0.30000019	0.97462416	0.97385710	0.97384959	0.97379100	0.97366911
161	0.35000038	0.96488947	0.96409625	0.96408778	0.96400011	0.96382439
166	0.40000057	0.95343029	0.95260292	0.95258987	0.95246834	0.95219779
171	0.44999981	0.94012952	0.93925714	0.93923521	0.93902159	0.93856871
176	0.50000000	0.92483717	0.92368358	0.92364383	0.92327636	0.92258829
181	0.55000019	0.90654159	0.90522116	0.90517038	0.90470910	0.90382648
186	0.60000038	0.88468587	0.88349462	0.88344198	0.88293737	0.88185269
191	0.65000057	0.85978401	0.85842007	0.85834032	0.85762709	0.85611320
196	0.69999981	0.83132356	0.82912457	0.82900423	0.82791328	0.82562608
201	0.75000000	0.79644710	0.79404658	0.79385924	0.79218727	0.78857970
206	0.80000019	0.75488704	0.75079137	0.75051051	0.74788040	0.74105316
211	0.85000038	0.70131552	0.69561601	0.69508880	0.68954778	0.67400789
216	0.90000057	0.63054931	0.61870319	0.61701471	0.59852022	0.57126737
221	0.94999981	0.52432567	0.45571113	0.45416176	0.43993616	0.42344636
226	1.00000000	0.0	0.21896535	0.22050083	0.23290569	0.25161719
231	1.05000019	0.0	0.04351304	0.04752041	0.07671708	0.11486638
236	1.10000038	0.0	0.00000000	0.00015892	0.01070389	0.03591161
241	1.15000057	0.0	0.0	0.00000000	0.00044370	0.00717550
246	1.19999981	0.0	0.0	0.00000000	0.00000414	0.00079302
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000582

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.99664384	-1.00549221	-1.00555706	-1.00591183	-1.00660229
2	0.53342736	+/-	0.01091558	-0.94418889	-0.95257211	-0.95263308	-0.95296991	-0.95362401
3	0.65479004	+/-	0.00818945	-0.89173394	-0.89965141	-0.89970905	-0.90002716	-0.90064490
4	0.75611269	+/-	0.00561380	-0.83927906	-0.84673077	-0.84678501	-0.84708440	-0.84766579
5	0.78291219	+/-	0.00675163	-0.78682411	-0.79381007	-0.79386091	-0.79414159	-0.79468668
6	0.80480182	+/-	0.00797137	-0.73436916	-0.74088937	-0.74093688	-0.74119884	-0.74170756
7	0.82743675	+/-	0.00623813	-0.68191421	-0.68796873	-0.68801278	-0.68825603	-0.68872845
8	0.86624938	+/-	0.00318797	-0.62945926	-0.63504803	-0.63508874	-0.63531327	-0.63574934
9	0.87631249	+/-	0.00395660	-0.57700431	-0.58212739	-0.58216465	-0.58237052	-0.58277023
10	0.89928478	+/-	0.00349412	-0.52454937	-0.52920669	-0.52924061	-0.52942771	-0.52979112
11	0.92002296	+/-	0.00552572	-0.47209442	-0.47628605	-0.47631651	-0.47648495	-0.47681201
12	0.94750106	+/-	0.00550232	-0.41963953	-0.42336535	-0.42339247	-0.42354220	-0.42383289
13	0.97597575	+/-	0.00535607	-0.36718458	-0.37044466	-0.37046844	-0.37059939	-0.37085378
14	0.97354567	+/-	0.00519064	-0.31472963	-0.31752402	-0.31754434	-0.31765664	-0.31787467
15	0.97948796	+/-	0.00472198	-0.26227468	-0.26460332	-0.26462030	-0.26471382	-0.26489556
16	0.97610867	+/-	0.00377265	-0.20981973	-0.21168268	-0.21169621	-0.21177107	-0.21191645
17	0.98010772	+/-	0.00352922	-0.15736479	-0.15876198	-0.15877217	-0.15882832	-0.15893734
18	0.98225969	+/-	0.00415973	-0.10490984	-0.10584134	-0.10584807	-0.10588551	-0.10595822
19	0.98542905	+/-	0.00458061	-0.05245494	-0.05292067	-0.05292406	-0.05294278	-0.05297911
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05245494	0.05292067	0.05292406	0.05294278	0.05297911
22	0.98186535	+/-	0.00326987	0.10490984	0.10584134	0.10584807	0.10588551	0.10595822
23	0.98517853	+/-	0.00420880	0.15736479	0.15876198	0.15877217	0.15882832	0.15893734
24	0.97912860	+/-	0.00481493	0.20981973	0.21168268	0.21169621	0.21177107	0.21191645
25	0.97057939	+/-	0.00490139	0.26227468	0.26460332	0.26462030	0.26471382	0.26489556
26	0.96084350	+/-	0.00525466	0.31472963	0.31752402	0.31754434	0.31765664	0.31787467
27	0.94119048	+/-	0.00554555	0.36718458	0.37044466	0.37046844	0.37059939	0.37085378
28	0.91906935	+/-	0.00509574	0.41963953	0.42336535	0.42339247	0.42354220	0.42383289
29	0.91350764	+/-	0.00542074	0.47209442	0.47628605	0.47631651	0.47648495	0.47681201
30	0.89249408	+/-	0.00553969	0.52454937	0.52920669	0.52924061	0.52942771	0.52979112
31	0.85914189	+/-	0.00620985	0.57700431	0.58212739	0.58216465	0.58237052	0.58277023
32	0.84589475	+/-	0.00721151	0.62945926	0.63504803	0.63508874	0.63531327	0.63574934
33	0.81060582	+/-	0.00680591	0.68191421	0.68796873	0.68801278	0.68825603	0.68872845
34	0.78447413	+/-	0.00577597	0.73436916	0.74088937	0.74093688	0.74119884	0.74170756
35	0.73478526	+/-	0.00650398	0.78682411	0.79381007	0.79386091	0.79414159	0.79468668
36	0.68907928	+/-	0.00965067	0.83927906	0.84673077	0.84678501	0.84708440	0.84766579
37	0.63452137	+/-	0.00845271	0.89173394	0.89965141	0.89970905	0.90002716	0.90064490
38	0.48173147	+/-	0.00703276	0.94418889	0.95257211	0.95263308	0.95296991	0.95362401
39	0.24655521	+/-	0.00533949	0.99664384	1.00549221	1.00555706	1.00591183	1.00660229
40	0.0	+/-	0.0	1.04909801	1.05841255	1.05848122	1.05885506	1.05958176

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000340	0.00069720
11	-1.14999866	0.0	0.0	0.00000000	0.00038205	0.00648244
16	-1.09999847	0.0	0.00000000	0.00012340	0.00951715	0.03295212
21	-1.04999924	0.0	0.03823721	0.04211813	0.07007593	0.10688859
26	-0.99999928	0.0	0.20267266	0.20430499	0.21748441	0.23736846
31	-0.94999933	0.49628210	0.42631012	0.42524147	0.41412395	0.40098238
36	-0.89999932	0.61006016	0.59746736	0.59563136	0.57661462	0.55028528
41	-0.84999931	0.68605214	0.67979074	0.67921698	0.67324209	0.65714914
46	-0.79999930	0.74305224	0.73865485	0.73834229	0.73547924	0.72811729
51	-0.74999928	0.78714854	0.78456718	0.78435844	0.78253585	0.77860135
56	-0.69999933	0.82402581	0.82161599	0.82148200	0.82028747	0.81778026
61	-0.64999932	0.85381240	0.85238433	0.85229552	0.85152173	0.84987533
66	-0.59999931	0.87987465	0.87862986	0.87857127	0.87803787	0.87687010
71	-0.54999930	0.90274817	0.90135199	0.90129459	0.90080351	0.89985859
76	-0:49999928	0.92183608	0.92062080	0.92057395	0.92018396	0.91944551
81	-0.44999933	0.93773896	0.93683207	0.93680918	0.93658173	0.93609935
86	-0.39999932	0.95157075	0.95071006	0.95069772	0.95057052	0.95028532
91	-0.34999931	0.96348667	0.96266150	0.96265107	0.96256346	0.96237779
96	-0.29999930	0.97361046	0.97281253	0.97280359	0.97274280	0.97261566
101	-0.25000000	0.98203540	0.98125941	0.98125392	0.98121214	0.98112732
106	-0.19999981	0.98883772	0.98807663	0.98807228	0.98804879	0.98799497
111	-0.14999962	0.99407339	0.99332470	0.99332136	0.99330735	0.99327856
116	-0.09999943	0.99778396	0.99704397	0.99704415	0.99703729	0.99702340
121	-0.05000019	1.00000000	0.99926251	0.99926221	0.99926150	0.99925768
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99926192	0.99926221	0.99926102	0.99925756
136	0.10000038	0.99778396	0.99704397	0.99704415	0.99703681	0.99702269
141	0.15000057	0.99407339	0.99332488	0.99332410	0.99331015	0.99327880
146	0.19999981	0.98883772	0.98807764	0.98807299	0.98804897	0.98799509
151	0.25000000	0.98203540	0.98125893	0.98125458	0.98121262	0.98112690
156	0.30000019	0.97361046	0.97281325	0.97280568	0.97274351	0.97261667
161	0.35000038	0.96348667	0.96266210	0.96265107	0.96256298	0.96237928
166	0.40000057	0.95157075	0.95071065	0.95069492	0.95057124	0.95028490
171	0.44999981	0.93773896	0.93683219	0.93680990	0.93658406	0.93610007
176	0.50000000	0.92183608	0.92062092	0.92057329	0.92018300	0.91944665
181	0.55000019	0.90274906	0.90135270	0.90129602	0.90080440	0.89985847
186	0.60000038	0.87987494	0.87862968	0.87857336	0.87803835	0.87687123
191	0.65000057	0.85381269	0.85238504	0.85229689	0.85152334	0.84987617
196	0.69999981	0.82402593	0.82161641	0.82148272	0.82028770	0.81778067
201	0.75000000	0.78714854	0.78456789	0.78435773	0.78253770	0.77859956
206	0.80000019	0.74305302	0.73865676	0.73834503	0.73548108	0.72821575
211	0.85000038	0.68605286	0.67979193	0.67921919	0.67332554	0.65768743
216	0.90000057	0.61006093	0.59747010	0.59571826	0.57775491	0.55205667
221	0.94999981	0.49628264	0.43123239	0.42998487	0.41807693	0.40442604
226	1.00000000	0.0	0.20339787	0.20502150	0.21811938	0.23786175
231	1.05000019	0.0	0.03819872	0.04208095	0.07004535	0.10686278
236	1.10000038	0.0	0.00000000	0.00012377	0.00952221	0.03295993
241	1.15000057	0.0	0.0	0.00000000	0.00038363	0.00649272
246	1.19999981	0.0	0.0	0.00000000	0.00000348	0.00070300
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000430

I	OBSERVATIONAL LIMB DARKENING			BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.98977625	-0.99752480	-0.99758977	-0.99795687	-0.99866009
2	0.53342736	+/-	0.01091558	-0.93768275	-0.94502348	-0.94508505	-0.94543284	-0.94609904
3	0.65479004	+/-	0.00818945	-0.88558924	-0.89252216	-0.89258033	-0.89290881	-0.89353800
4	0.75611269	+/-	0.00561380	-0.83349580	-0.84002090	-0.84007561	-0.84038478	-0.84097695
5	0.78291219	+/-	0.00675163	-0.78140229	-0.78751957	-0.78757083	-0.78786069	-0.78841585
6	0.80480182	+/-	0.00797137	-0.72930878	-0.73501825	-0.73506612	-0.73533666	-0.73585480
7	0.82743675	+/-	0.00623813	-0.67721528	-0.68251693	-0.68256140	-0.68281263	-0.68329376
8	0.86624938	+/-	0.00318797	-0.62512183	-0.63001567	-0.63005668	-0.63028854	-0.63073272
9	0.87631249	+/-	0.00395660	-0.57302833	-0.57751435	-0.57755196	-0.57776451	-0.57817161
10	0.89928478	+/-	0.00349412	-0.52093482	-0.52501303	-0.52504724	-0.52524048	-0.52561057
11	0.92002296	+/-	0.00552572	-0.46884137	-0.47251171	-0.47254252	-0.47271639	-0.47304952
12	0.94750106	+/-	0.00550232	-0.41674787	-0.42001045	-0.42003781	-0.42019236	-0.42048848
13	0.97597575	+/-	0.00535607	-0.36465436	-0.36750913	-0.36753303	-0.36766833	-0.36792737
14	0.97354567	+/-	0.00519064	-0.31256092	-0.31500781	-0.31502831	-0.31514424	-0.31536633
15	0.97948796	+/-	0.00472198	-0.26046741	-0.26250648	-0.26252359	-0.26262021	-0.26280528
16	0.97610867	+/-	0.00377265	-0.20837390	-0.21000522	-0.21001887	-0.21009618	-0.21024424
17	0.98010772	+/-	0.00352922	-0.15628046	-0.15750390	-0.15751415	-0.15757209	-0.15768313
18	0.98225969	+/-	0.00415973	-0.10418695	-0.10500258	-0.10500944	-0.10504806	-0.10512209
19	0.98542905	+/-	0.00458061	-0.05209349	-0.05250131	-0.05250473	-0.05252405	-0.05256106
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05209349	0.05250131	0.05250473	0.05252405	0.05256106
22	0.98186535	+/-	0.00326987	0.10418695	0.10500258	0.10500944	0.10504806	0.10512209
23	0.98517853	+/-	0.00420880	0.15628046	0.15750390	0.15751415	0.15757209	0.15768313
24	0.97912860	+/-	0.00481493	0.20837390	0.21000522	0.21001887	0.21009618	0.21024424
25	0.97057939	+/-	0.00490139	0.26046741	0.26250648	0.26252359	0.26262021	0.26280528
26	0.96084350	+/-	0.00525466	0.31256092	0.31500781	0.31502831	0.31514424	0.31536633
27	0.94119048	+/-	0.00554555	0.36465436	0.36750913	0.36753303	0.36766833	0.36792737
28	0.91906935	+/-	0.00509574	0.41674787	0.42001045	0.42003781	0.42019236	0.42048848
29	0.91350764	+/-	0.00542074	0.46884137	0.47251171	0.47254252	0.47271639	0.47304952
30	0.89249408	+/-	0.00553969	0.52093482	0.52501303	0.52504724	0.52524048	0.52561057
31	0.85914189	+/-	0.00620985	0.57302833	0.57751435	0.57755196	0.57776451	0.57817161
32	0.84589475	+/-	0.00721151	0.62512183	0.63001567	0.63005668	0.63028854	0.63073272
33	0.81060582	+/-	0.00680591	0.67721528	0.68251693	0.68256140	0.68281263	0.68329376
34	0.78447413	+/-	0.00577597	0.72930878	0.73501825	0.73506612	0.73533666	0.73585480
35	0.73478526	+/-	0.00650398	0.78140229	0.78751957	0.78757083	0.78786069	0.78841585
36	0.68907928	+/-	0.00965067	0.83349580	0.84002090	0.84007561	0.84038478	0.84097695
37	0.63452137	+/-	0.00845271	0.88558924	0.89252216	0.89258033	0.89290881	0.89353800
38	0.48173147	+/-	0.00703276	0.93768275	0.94502348	0.94508505	0.94543284	0.94609904
39	0.24655521	+/-	0.00533949	0.98977625	0.99752480	0.99758977	0.99795687	0.99866009
40	0.0	+/-	0.0	1.04186916	1.05002594	1.05009365	1.05048084	1.05122089

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000371	0.00074795
11	-1.14999866	0.0	0.0	0.00000000	0.00041328	0.00689520
16	-1.09999847	0.0	0.0000000C	0.00013757	0.01019539	0.03482852
21	-1.04999924	0.0	0.04124378	0.04525739	0.07428205	0.11223263
26	-0.99999928	0.0	0.21337754	0.21496761	0.22783172	0.24723828
31	-0.94999933	0.51762003	0.44335270	0.44211996	0.42958552	0.41457528
36	-0.89999932	0.62676388	0.61445689	0.61260796	0.59278995	0.56503558
41	-0.84999931	0.69907099	0.69317704	0.69262826	0.68680751	0.67051607
46	-0.79999930	0.75357604	0.74936217	0.74906582	0.74634904	0.73920310
51	-0.74999928	0.79571831	0.79325676	0.79305679	0.79132897	0.78759199
56	-0.69999933	0.83099353	0.82870764	0.82858032	0.82745129	0.82507652
61	-0.64999932	0.85956377	0.85819215	0.85810894	0.85737491	0.85581571
66	-0.59999931	0.88456154	0.88336617	0.88330787	0.88280189	0.88169450
71	-0.54999930	0.90650129	0.90516740	0.90511131	0.90464538	0.90375018
76	-0.49999928	0.92483354	0.92367023	0.92362624	0.92325526	0.92255706
81	-0.44999933	0.94012618	0.93925363	0.93923128	0.93901581	0.93855745
86	-0.39999932	0.95342791	0.95260024	0.95258766	0.95246583	0.95219284
91	-0.34999931	0.96488720	0.96409345	0.96408290	0.96399772	0.96382254
96	-0.29999930	0.97462207	0.97385567	0.97384834	0.97378707	0.97366655
101	-0.25000000	0.98272461	0.98197764	0.98197329	0.98193210	0.98185199
106	-0.19999981	0.98926628	0.98853463	0.98852861	0.98850667	0.98845661
111	-0.14999962	0.99430102	0.99358082	0.99357957	0.99356502	0.99353749
116	-0.09999943	0.99786949	0.99715781	0.99715543	0.99715126	0.99713695
121	-0.05000019	1.C0000000	0.99929082	0.99929035	0.99928921	0.99928546
126	0.0	1.00C00000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.C0C00C00	0.99929053	0.99928904	0.99928874	0.99928516
136	0.10000038	0.99786949	0.99715751	0.99715680	0.99715036	0.99713790
141	0.15000057	0.99430102	0.99358124	0.99357957	0.99356550	0.99353790
146	0.19999981	0.98926628	0.98853517	0.98852861	0.98850715	0.98845577
151	0.25000000	0.98272461	0.98197812	0.98197329	0.98193324	0.98185217
156	0.30000019	C.97462291	0.97385496	0.97385174	0.97378820	0.97366768
161	0.35000038	0.96488720	0.96409398	0.96408218	0.96399844	0.96382272
166	0.40000057	0.95342791	0.95260024	0.95258492	0.95246559	0.95219356
171	0.44999981	0.94012618	0.93925375	0.93922991	0.93901676	0.93855733
176	0.50000000	0.92483354	0.92367053	0.92362624	0.92325664	0.92255664
181	0.55000019	0.90650213	0.90516770	0.90511131	0.90464813	0.90375090
186	0.60000038	0.88456154	0.88336629	0.88331062	0.88280439	0.88169509
191	0.65000057	0.85956407	0.85819334	0.85810965	0.85737717	0.85581487
196	0.69999981	0.83C99365	0.82870865	0.82858098	0.82745314	0.82507747
201	0.75000000	0.79571831	0.79325724	0.79305613	0.79132897	0.78758818
206	0.80000019	0.75357676	0.7493636C	0.74906856	0.74635196	0.73931420
211	0.85000038	0.69907165	0.69317907	0.69263011	0.68690240	0.67112464
216	0.90000057	0.62676460	C.61445916	0.61270601	0.59407973	0.56704044
221	0.94999981	0.51762056	0.44893175	0.44749564	0.43406802	0.41847783
226	1.00000000	0.0	0.21417C99	0.21575230	0.22852665	0.24777782
231	1.05000019	C.0	0.04120173	0.04521661	0.07424861	0.11220443
236	1.10000038	0.0	0.00000000	0.00013798	0.01020089	0.03483696
241	1.15000057	C.0	0.0	0.00000000	0.00041501	0.0069C640
246	1.19999981	0.0	0.0	0.00000000	0.00000379	0.00075429
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000486

I	OBSERVATIONAL LIMB DARKENING	SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383 +/- 0.00996722	-0.99574071	-1.00414848	-1.00421238	-1.00457096	-1.00525665
2	0.53342736 +/- 0.01091558	-0.94333327	-0.95129919	-0.95135915	-0.95169908	-0.95234901
3	0.65479004 +/- 0.C0818945	-0.89092588	-0.89844924	-0.89850587	-0.89882690	-0.89944071
4	0.75611269 +/- 0.C0561380	-C.83851850	-C.84559929	-0.84565258	-0.84595478	-0.84653246
5	0.78291219 +/- 0.00675163	-0.78611106	-0.79274929	-0.79279929	-0.79308259	-0.79362416
6	0.80480182 +/- 0.00797137	-C.73370367	-0.73989934	-0.73994601	-0.74021041	-0.74071586
7	0.82743675 +/- 0.00623813	-0.68129623	-0.68704939	-0.68709272	-0.68733823	-0.68780762
8	0.86624938 +/- 0.00318797	-0.62888885	-0.63419944	-0.63423944	-0.63446605	-0.63489932
9	0.87631249 +/- 0.00395660	-0.57648146	-0.58134949	-0.58138615	-0.58159387	-0.58199102
10	0.89928478 +/- 0.00349412	-0.52407402	-0.52849954	-0.52853286	-0.52872169	-0.52908278
11	0.92002296 +/- 0.00552572	-0.47166663	-0.47564960	-0.47567958	-0.47584951	-0.47617447
12	0.94750106 +/- 0.00550232	-0.41925925	-0.42279965	-0.42282629	-0.42297739	-0.42326623
13	0.97597575 +/- 0.00535607	-0.36685181	-0.36994964	-0.36997300	-0.37010521	-0.37035793
14	0.97354567 +/- 0.C0519064	-0.31444442	-0.31709969	-0.31711972	-0.31723303	-0.31744963
15	0.97948796 +/- 0.00472198	-0.26203698	-0.26424974	-0.26426643	-0.26436085	-0.26454139
16	0.97610867 +/- 0.00377265	-0.20962960	-0.21139979	-0.21141315	-0.21148866	-0.21163309
17	0.98010772 +/- 0.C0352922	-0.15722221	-0.15854985	-0.15855986	-0.15861648	-0.15872478
18	0.98225969 +/- 0.00415973	-0.10481477	-0.10569990	-0.10570657	-0.10574430	-0.10581654
19	0.98542905 +/- 0.CC458061	-C.05240741	-0.05284996	-0.05285329	-0.05287217	-0.05290828
20	1.00000000 +/- 0.00369757	C.0	0.0	0.0	0.0	0.0
21	0.99866104 +/- 0.C0376610	C.05240741	0.05284996	0.05285329	0.05287217	0.05290828
22	0.98186535 +/- 0.00326987	0.10481477	0.1056999C	0.10570657	0.10574430	0.10581654
23	0.98517853 +/- 0.C0420880	0.15722221	0.15854985	0.15855986	0.15861648	0.15872478
24	0.97912860 +/- 0.00481493	0.20962960	0.21139979	0.21141315	0.21148866	0.21163309
25	0.97057939 +/- 0.00490139	0.26203698	0.26424974	0.26426643	0.26436085	0.26454139
26	0.96084350 +/- 0.00525466	0.31444442	0.31709969	0.31711972	0.31723303	0.31744963
27	0.94119048 +/- 0.00554555	0.36685181	0.36994964	0.36997300	0.37010521	0.37035793
28	0.91906935 +/- 0.00509574	0.41925925	0.42279965	0.42282629	0.42297739	0.42326623
29	0.91350764 +/- 0.00542074	0.47166663	0.47564960	0.47567958	0.47584951	0.47617447
30	0.89249408 +/- 0.00553969	0.52407402	0.52849954	0.52853286	0.52872169	0.52908278
31	0.85914189 +/- 0.00620985	0.57648146	0.58134949	0.58138615	0.58159387	0.58199102
32	0.84589475 +/- 0.00721151	0.62888885	0.63419944	0.63423944	0.63446605	0.63489932
33	0.81060582 +/- 0.00680591	0.68129623	0.68704939	0.68709272	0.68733823	0.68780762
34	0.78447413 +/- 0.00577597	0.73370367	0.73989934	0.73994601	0.74021041	0.74071586
35	0.73478526 +/- 0.C0650398	C.78611106	C.79274929	0.79279929	0.79308259	0.79362416
36	0.68907926 +/- 0.C0965067	0.83851850	0.84559929	0.84565258	0.84595478	0.84653246
37	0.63452137 +/- 0.00845271	0.89C92588	0.89844924	0.89850587	0.89882690	0.89944071
38	0.48173147 +/- 0.00703276	0.94333327	0.95129919	0.95135915	0.95169908	0.95234901
39	0.24655521 +/- 0.00533949	0.99574071	1.00414848	1.00421238	1.00457096	1.00525665
40	0.0 +/- 0.0	1.04814720	1.05699825	1.05706501	1.05744267	1.05816555

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000315	0.00067124
11	-1.14999866	0.0	0.0	0.00000000	0.00036144	0.00631209
16	-1.09999847	0.0	0.0000000C	0.00010698	0.00917731	0.03231950
21	-1.04999924	0.0	0.03662868	0.04054835	0.06858683	0.10548234
26	-0.99999928	0.0	0.20037383	0.20204788	0.21554905	0.23588097
31	-0.94999933	0.49466360	0.42469084	0.42365652	0.41282415	0.40003341
36	-0.89999932	0.61055022	0.59739745	0.59550416	0.57636660	0.55002081
41	-0.84999931	0.68695086	0.68067324	0.68008232	0.67394871	0.65763390
46	-0.79999930	0.74439621	0.73981220	0.73949480	0.73657048	0.72905868
51	-0.74999928	0.78837276	0.78577954	0.78556627	0.78370655	0.77969682
56	-0.69999933	0.82513714	0.82272696	0.82259238	0.82139146	0.81885779
61	-0.64999932	0.85480303	0.85338110	0.85329431	0.85251707	0.85086465
66	-0.59999931	0.88075984	0.87952077	0.87946302	0.87892538	0.87775445
71	-0.54999930	0.90354103	0.90214002	0.90207940	0.90158314	0.90063041
76	-0.49999928	0.92250848	0.92129081	0.92124534	0.92084736	0.92010349
81	-0.44999933	0.93827379	0.93737525	0.93735242	0.93712395	0.93663943
86	-0.39999932	0.95198691	0.95113325	0.95111942	0.95099443	0.95071030
91	-0.34999931	0.96380091	0.96298313	0.96297449	0.96288443	0.96270162
96	-0.29999930	0.97383696	0.97304654	0.97304064	0.97297764	0.97285247
101	-0.25000000	0.98219025	C.98142064	0.98141515	0.98137373	0.98129028
106	-0.19999981	0.98893356	0.98818004	0.98817694	0.98815012	0.98809773
111	-0.14999962	0.99412382	0.99338239	0.99338174	0.99336481	0.99333680
116	-0.09999943	0.99780327	0.99706960	0.99706793	0.99706197	0.99704945
121	-0.05000019	1.00000000	0.99926913	0.99927080	0.99926710	0.99926442
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99926913	0.99927080	0.99926776	0.99926388
136	0.10000038	0.99780327	0.99706978	0.99707240	0.99706197	0.99704945
141	0.15000057	0.99412459	0.99338239	0.99338299	0.99336630	0.99333745
146	0.19999981	C.98893356	0.98818016	0.98817885	0.98815072	0.98809898
151	0.25000000	0.98219025	C.98142087	0.98141772	0.98137373	0.98129028
156	0.30000019	C.97383696	0.97304636	0.97304064	0.97297657	0.97285300
161	0.35000038	C.96380091	0.96298355	0.96297449	0.96288550	0.96270317
166	0.40000057	0.95198691	C.95113432	0.95112139	0.95099568	0.95071059
171	0.44999981	C.93827456	0.93737543	0.93735111	0.93712527	0.93664008
176	0.50000000	0.92250848	0.92129093	0.92124724	0.92084861	0.92010480
181	0.55000019	0.90354103	0.90214032	0.90208256	0.90158588	0.90063232
186	0.60000038	0.88075984	0.87952119	0.87946236	0.87892705	0.87775522
191	0.65000057	0.85480303	0.85338163	0.85329241	0.85251945	0.85086584
196	0.69999981	0.82513714	0.82272726	0.82259238	0.82139295	0.81885856
201	0.75000000	0.78837276	0.78578031	0.78556627	0.78370780	0.77969438
206	0.80000019	C.74439692	0.73981404	0.73949605	0.73657429	0.72914195
211	0.85000038	0.68695170	0.68067539	0.68008429	0.67401880	0.65807641
216	0.90000057	C.61055100	0.59740031	0.59557557	0.57730031	0.55146992
221	0.94999981	0.49466419	0.42870069	0.42752004	0.41604418	0.40283871
226	1.00000000	C.0	0.20105237	0.20271868	0.21614367	0.23634231
231	1.05000019	C.0	0.03659204	0.04051296	0.06855774	0.10545784
236	1.10000038	C.0	C.C0000000	0.00010734	0.00918215	0.03232696
241	1.15000057	C.0	0.0	0.00000000	0.00036295	0.00632188
246	1.19999981	C.0	0.0	0.00000000	0.00000322	0.00067671
251	1.25000000	C.0	0.0	0.0	0.00000000	0.00000354

I	OBSERVATIONAL LIMB DARKENING	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383 +/- 0.CC996722	-C.99027836	-0.99773085	-0.99779809	-0.99815577	-0.99885064
2	0.53342736 +/- 0.01091558	-0.93815845	-0.94521868	-0.94528240	-0.94562125	-0.94627959
3	0.65479004 +/- 0.00818945	-0.88603854	-0.89270651	-0.89276671	-0.89308673	-0.89370847
4	0.75611269 +/- 0.C0561380	-0.83391863	-0.84019440	-0.84025103	-0.84055227	-0.84113741
5	0.78291219 +/- 0.00675163	-0.78179866	-0.78768224	-0.78773528	-0.78801775	-0.78856629
6	0.80480182 +/- 0.00797137	-0.72967875	-0.73517C07	-0.73521960	-0.73548323	-0.73599523
7	0.82743675 +/- 0.00623813	-0.67755884	-0.68265790	-0.68270391	-0.68294871	-0.68342412
8	0.86624936 +/- 0.00318797	-0.62543893	-0.63014579	-0.63018823	-0.63041419	-0.63085306
9	0.87631249 +/- 0.00395660	-0.57331902	-0.57763362	-0.57767254	-0.57787967	-0.57828194
10	0.89928478 +/- 0.00349412	-0.52119911	-0.52512145	-0.52515686	-0.52534515	-0.52571088
11	0.92002296 +/- 0.0C552572	-0.46907920	-0.47260934	-0.47264117	-0.47281063	-0.47313976
12	0.94750106 +/- 0.C0550232	-0.41695929	-0.42009717	-0.42012548	-0.42027611	-0.42056870
13	0.97597575 +/- 0.00535607	-0.36483938	-0.36758500	-0.36760980	-0.36774158	-0.36799759
14	0.97354567 +/- 0.C0519064	-0.31271946	-0.31507289	-0.31509411	-0.31520706	-0.31542653
15	0.97948796 +/- 0.00472198	-0.26059955	-0.26256073	-0.26257843	-0.26267254	-0.26285541
16	0.97610867 +/- 0.00377265	-C.20847964	-0.21004856	-0.21006274	-0.21013802	-0.21028435
17	0.98010772 +/- 0.00352922	-0.15635973	-0.15753645	-0.15754706	-0.15760350	-0.15771323
18	0.98225969 +/- 0.00415973	-0.10423982	-0.10502428	-0.10503137	-0.10506898	-0.10514218
19	0.98542905 +/- 0.00458061	-0.05211991	-0.05251215	-0.05251569	-0.05253452	-0.05257109
20	1.00000000 +/- 0.00369757	C.0	0.0	0.0	0.0	0.0
21	0.99866104 +/- 0.C0376810	C.05211991	0.05251215	0.05251569	0.05253452	0.05257109
22	0.98186535 +/- 0.00326987	0.10423982	0.10502428	0.10503137	0.10506898	0.10514218
23	0.98517853 +/- 0.00420880	0.15635973	0.15753645	0.15754706	0.15760350	0.15771323
24	0.97912860 +/- 0.00481493	0.20847964	0.21004856	0.21006274	0.21013802	0.21028435
25	0.97057939 +/- 0.00490139	0.26059955	0.26256073	0.26257843	0.26267254	0.26285541
26	0.96084350 +/- 0.00525466	0.31271946	0.31507289	0.31509411	0.31520706	0.31542653
27	0.94119048 +/- 0.00554555	0.36483938	0.36758500	0.36760980	0.36774158	0.36799759
28	0.91906935 +/- 0.00509574	0.41695929	0.42009717	0.42012548	0.42027611	0.42056870
29	0.91350764 +/- 0.00542074	0.46907920	0.47260934	0.47264117	0.47281063	0.47313976
30	0.89249408 +/- 0.CC553969	0.52119911	0.52512145	0.52515686	0.52534515	0.52571088
31	0.85914189 +/- 0.00620985	C.57331902	0.57763362	0.57767254	0.57787967	0.57828194
32	0.84589475 +/- 0.C0721151	C.62543893	0.63014579	0.63018823	0.63041419	0.63085306
33	0.81060582 +/- 0.CC680591	0.67755884	0.68265790	0.68270391	0.68294871	0.68342412
34	0.78447413 +/- 0.00577597	0.72967875	0.73517007	0.73521960	0.73548323	0.73599523
35	0.73478526 +/- 0.00650398	C.78179866	0.78768224	0.78773528	0.78801775	0.78856629
36	0.68907928 +/- 0.00965067	0.83391863	0.8401944C	0.84025103	0.84055227	0.84113741
37	0.63452137 +/- 0.00845271	0.88603854	0.89270651	0.89276671	0.89308673	0.89370847
38	0.48173147 +/- 0.00703276	0.93815845	C.94521868	0.94528240	0.94562125	0.94627959
39	0.24655521 +/- 0.C0533949	0.99027836	0.99773085	0.99779809	0.99815577	0.99885064
40	0.0 +/- 0.0	1.04239750	1.05024242	1.05031300	1.05068970	1.05142117

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000490	0.00090269
11	-1.14999866	0.0	0.0	0.00000000	0.00051921	0.00806333
16	-1.09999847	0.0	0.00000000	0.00020311	0.01223902	0.03985064
21	-1.04999924	0.0	0.05043774	0.05463546	0.08562440	0.12581390
26	-0.99999928	0.0	0.23910487	0.24057043	0.25244480	0.27037019
31	-0.94999933	0.56385708	0.48141289	0.47981369	0.46410334	0.44493932
36	-0.89999932	0.66301262	0.65169847	0.64989781	0.62854815	0.59781426
41	-0.84999931	0.72825724	0.72292417	0.72242552	0.71694720	0.70029765
46	-0.79999930	0.77743483	0.77360070	0.77333564	0.77088064	0.76415151
51	-0.74999928	0.81538218	0.81316435	0.81298679	0.81143564	0.80807698
56	-0.69999933	0.84717178	0.84512579	0.84501225	0.84400773	0.84188706
61	-0.64999932	0.87298167	0.87174010	0.87166661	0.87101257	0.86962241
66	-0.59999931	0.89556372	0.89448136	0.89443219	0.89397717	0.89299059
71	-0.54999930	0.91538423	0.91418111	0.91413194	0.91371733	0.91291714
76	-0.49999928	0.93196148	0.93091160	0.93087125	0.93053955	0.92991930
81	-0.44999933	0.94580352	0.94501323	0.94499469	0.94479924	0.94439238
86	-0.39999932	0.95784426	0.95709330	0.95708257	0.95697391	0.95673150
91	-0.34999931	0.96821648	0.96749794	0.96748990	0.96741289	0.96725518
96	-0.29999930	0.97702914	0.97633356	0.97632754	0.97627366	0.97616643
101	-0.25000000	0.98436266	0.98368692	0.98368222	0.98364514	0.98357397
106	-0.19999981	0.99028367	0.98962134	0.98961973	0.98959637	0.98955142
111	-0.14999962	0.99484134	0.99418974	0.99418932	0.99417597	0.99415028
116	-0.09999943	0.99807107	0.99742758	0.99742430	0.99742025	0.99740911
121	-0.05000019	1.00000000	0.99935788	0.99935728	0.99935615	0.99935395
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99935800	0.99935728	0.99935639	0.99935329
136	0.10000038	0.99807191	0.99742675	0.99742639	0.99742073	0.99740940
141	0.15000057	0.99484134	0.99418944	0.99418724	0.99417502	0.99414945
146	0.19999981	0.99028367	0.98962206	0.98962110	0.98959637	0.98955208
151	0.25000000	0.98436266	0.98368680	0.98368222	0.98364538	0.98357385
156	0.30000019	0.97702914	0.97633386	0.97632682	0.97627389	0.97616655
161	0.35000038	0.96821731	0.96749794	0.96748853	0.96741337	0.96725601
166	0.40000057	0.95784426	0.95709401	0.95708120	0.95697480	0.95673108
171	0.44999981	0.94580436	0.94501340	0.94499403	0.94480038	0.94439262
176	0.50000000	0.93196148	0.93091160	0.93087405	0.93054163	0.92991918
181	0.55000019	0.91538423	0.91418165	0.91413474	0.91371846	0.91291827
186	0.60000038	0.89556456	0.89448196	0.89443082	0.89397877	0.89299142
191	0.65000057	0.87298185	0.87174082	0.87166589	0.87101376	0.86962384
196	0.69999981	0.84717190	0.84512669	0.84501570	0.84400773	0.84188849
201	0.75000000	0.81538218	0.81316495	0.81298614	0.81143636	0.80807155
206	0.80000019	0.77743548	0.77360183	0.77333701	0.77088410	0.76432455
211	0.85000038	0.72825795	0.72292638	0.72242725	0.71710020	0.70126921
216	0.90000057	0.66301334	0.65170008	0.65005332	0.63061899	0.60103154
221	0.94999981	0.56385767	0.49043822	0.48851031	0.47135258	0.45125246
226	1.00000000	0.0	0.24006295	0.24151742	0.25328004	0.27102172
231	1.05000019	0.0	0.05038836	0.05458767	0.08558518	0.12578076
236	1.10000038	0.0	0.00000000	0.00020360	0.01224545	0.03986050
241	1.15000057	0.0	0.0	0.00000000	0.00052125	0.00807651
246	1.19999981	0.0	0.0	0.00000000	0.00000499	0.00091026
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000774

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-1.00919724	-1.01947498	-1.01953506	-1.01987457	-1.02051544
2	0.53342736	+/-	0.01091558	-0.95608199	-0.96581858	-0.96587545	-0.96619695	-0.96680474
3	0.65479004	+/-	0.00818945	-0.90296632	-0.91216201	-0.91221571	-0.91251934	-0.91309339
4	0.75611269	+/-	0.00561380	-0.84985065	-0.85850543	-0.85855597	-0.85884178	-0.85938203
5	0.78291219	+/-	0.00675163	-0.79673499	-0.80484879	-0.80489618	-0.80516416	-0.80567062
6	0.80480182	+/-	0.00797137	-0.74361932	-0.75119221	-0.75123644	-0.75148654	-0.75195926
7	0.82743675	+/-	0.00623813	-0.69050366	-0.69753563	-0.69757670	-0.69780892	-0.69824785
8	0.86624936	+/-	0.00318797	-0.63738799	-0.64387906	-0.64391696	-0.64413130	-0.64453650
9	0.87631249	+/-	0.00395660	-0.58427233	-0.59022248	-0.59025723	-0.59045368	-0.59082514
10	0.89928478	+/-	0.00349412	-0.53115666	-0.53656584	-0.53659743	-0.53677607	-0.53711373
11	0.92002296	+/-	0.00552572	-0.47804099	-0.48290926	-0.48293769	-0.48309845	-0.48340237
12	0.94750106	+/-	0.00550232	-0.42492533	-0.42925268	-0.42927796	-0.42942089	-0.42969102
13	0.97597575	+/-	0.00535607	-0.37180966	-0.37559611	-0.37561822	-0.37574327	-0.37597960
14	0.97354567	+/-	0.00519064	-0.31869400	-0.32193953	-0.32195848	-0.32206565	-0.32226825
15	0.97948796	+/-	0.00472198	-0.26557833	-0.26828289	-0.26829869	-0.26838803	-0.26855683
16	0.97610867	+/-	0.00377265	-0.21246266	-0.21462631	-0.21463895	-0.21471041	-0.21484548
17	0.98010772	+/-	0.00352922	-0.15934700	-0.16096973	-0.16097921	-0.16103280	-0.16113412
18	0.98225969	+/-	0.00415973	-0.10623133	-0.10731316	-0.10731947	-0.10735518	-0.10742271
19	0.98542905	+/-	0.00458061	-0.05311567	-0.05365659	-0.05365975	-0.05367761	-0.05371138
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05311567	0.05365659	0.05365975	0.05367761	0.05371138
22	0.98186535	+/-	0.00326987	0.10623133	0.10731316	0.10731947	0.10735518	0.10742271
23	0.98517853	+/-	0.00420880	0.15934700	0.16096973	0.16097921	0.16103280	0.16113412
24	0.97912860	+/-	0.00481493	0.21246266	0.21462631	0.21463895	0.21471041	0.21484548
25	0.97057939	+/-	0.00490139	0.26557833	0.26828289	0.26829869	0.26838803	0.26855683
26	0.96084350	+/-	0.00525466	0.31869400	0.32193953	0.32195848	0.32206565	0.32226825
27	0.94119048	+/-	0.00554555	0.37180966	0.37559611	0.37561822	0.37574327	0.37597960
28	0.91906935	+/-	0.00509574	0.42492533	0.42925268	0.42927796	0.42942089	0.42969102
29	0.91350764	+/-	0.00542074	0.47804099	0.48290926	0.48293769	0.48309845	0.48340237
30	0.89249408	+/-	0.00553969	0.53115666	0.53656584	0.53659743	0.53677607	0.53711373
31	0.85914189	+/-	0.00620985	0.58427233	0.59022248	0.59025723	0.59045368	0.59082514
32	0.84589475	+/-	0.00721151	0.63738799	0.64387906	0.64391696	0.64413130	0.64453650
33	0.81060582	+/-	0.00680591	0.69050366	0.69753563	0.69757670	0.69780892	0.69824785
34	0.78447413	+/-	0.00577597	0.74361932	0.75119221	0.75123644	0.75148654	0.75195926
35	0.73478526	+/-	0.00650398	0.79673499	0.80484879	0.80489618	0.80516416	0.80567062
36	0.68907928	+/-	0.00965067	0.84985065	0.85850543	0.85855597	0.85884178	0.85938203
37	0.63452137	+/-	0.00845271	0.90296632	0.91216201	0.91221571	0.91251934	0.91309339
38	0.48173147	+/-	0.00703276	0.95608199	0.96581858	0.96587545	0.96619695	0.96680474
39	0.24655521	+/-	0.00533949	1.00919724	1.01947498	1.01953506	1.01987457	1.02051544
40	0.0	+/-	0.0	1.06231308	1.07313156	1.07319450	1.07355213	1.07422733

TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000354	0.00073791
11	-1.14999866	0.0	0.0	0.00000000	0.00040184	0.00686004
16	-1.09999847	0.0	C.00000000	0.00012403	0.01007097	0.03483073
21	-1.04999924	0.0	0.04059504	0.04469690	0.07420677	0.11269611
26	-0.99999928	0.0	0.21484703	0.21647096	0.22961199	0.24940950
31	-0.94999933	0.52366781	0.44813329	0.44688869	0.43421942	0.41899413
36	-0.89999932	0.63417792	0.62144715	0.61953634	0.59931052	0.57102120
41	-0.84999931	0.70659095	0.70051426	0.69994164	0.69392425	0.67721343
46	-0.79999930	C.76062924	0.75626075	0.75595480	0.75315714	0.74580735
51	-0.74999928	0.80185294	0.79940748	0.79920363	0.79744619	0.79363596
56	-0.69999933	0.83629799	0.83402359	0.83389753	0.83276856	0.83038110
61	-0.64999932	0.86404818	0.86271447	0.86262918	0.86190617	0.86035919
66	-0.59999931	0.888329C3	0.88716787	0.88711303	0.88661438	0.88552380
71	-0.54999930	0.90963960	0.90833044	0.90827399	0.90781587	0.90693074
76	-0.49999928	0.92739636	0.92625844	0.92621428	0.92584687	0.92515743
81	-0.44999933	0.94216812	0.94132453	0.94130272	0.94109088	0.94064170
86	-0.39999932	0.95501584	0.95421469	0.95420259	0.95408565	0.95382088
91	-0.34999931	0.96608466	0.96531707	0.96530920	0.96522635	0.96505624
96	-0.29999930	0.97548771	0.97474641	0.97473931	0.97468168	0.97456491
101	-0.25000000	0.98331404	0.98259199	0.98258805	0.98254859	0.98247081
106	-0.19999981	C.98963219	C.98892534	0.98892230	0.98889840	0.98884863
111	-0.14999962	0.99449515	0.99379975	0.99379814	0.99378431	0.99375695
116	-0.09999943	0.99794209	0.99725372	0.99725276	0.99724722	0.99723399
121	-0.05000019	1.C0000000	0.99931473	0.99931645	0.99931437	0.99930978
126	0.0	1.CC00000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99931484	0.99931586	0.99931413	0.99930865
136	0.10000038	0.99794286	0.99725425	0.99725217	0.99724787	0.99723399
141	0.15000057	0.99449515	0.99379957	0.99379879	0.99378514	0.99375683
146	0.19999981	0.98963219	0.98892576	0.98892355	0.98889881	0.98884887
151	0.25000000	0.98331404	0.98259187	0.98258555	0.98254842	0.98247021
156	0.30000019	0.97548771	0.97474617	0.97473931	0.97468126	0.97456503
161	0.35000038	C.96608466	0.96531761	0.96531051	0.96522719	0.96505696
166	0.40000057	0.95501584	0.95421523	0.95420194	0.95408779	0.95382124
171	0.44999981	0.94216812	0.94132495	0.94130331	0.94109148	0.94064218
176	0.50000000	0.92739636	0.92625821	0.92621493	0.92584795	0.92515832
181	0.55000019	0.90963960	0.90833092	0.90827781	0.90781689	0.90693110
186	0.60000038	0.88832980	0.88716829	0.88711429	0.88661623	0.88552415
191	0.65000057	0.86404896	0.86271536	0.86263108	0.86190873	0.86035907
196	0.69999981	0.83629799	0.83402425	0.83389688	0.83276963	0.83038199
201	0.75000000	0.80185294	0.79940844	0.79920363	0.79744810	0.79363269
206	0.80000019	0.76062995	0.75626272	0.75595605	0.75316131	0.74590349
211	0.85000038	0.70659161	0.70051610	0.69994289	0.69400454	0.67773718
216	0.90000057	0.63417870	0.62144965	0.61962068	0.60041809	0.57274091
221	0.94999981	0.52366841	0.45289624	0.45147783	0.43804550	0.42232543
226	1.00000000	0.0	0.21562368	0.21723837	0.23028898	0.24993753
231	1.05000019	0.0	0.04055323	0.04465640	0.07417351	0.11266804
236	1.10000038	0.0	0.00000000	0.00012443	0.01007646	0.03483915
241	1.15000057	0.0	0.0	0.00000000	0.00040355	0.00687116
246	1.19999981	0.0	0.0	0.00000000	0.00000362	0.00074416
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000419

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.99925613	-1.00759411	-1.00765705	-1.00800228	-1.00866127
2	0.53342736	+/-	0.01091558	-0.94666374	-0.95456332	-0.95462275	-0.95495009	-0.95557469
3	0.65479004	+/-	0.00818945	-0.89407128	-0.90153199	-0.90158814	-0.90189731	-0.90248722
4	0.75611269	+/-	0.00561380	-0.84147888	-0.84850073	-0.84855360	-0.84884453	-0.84939975
5	0.78291219	+/-	0.00675163	-0.76888643	-0.7954694C	-0.79551899	-0.79579175	-0.79631221
6	0.80480182	+/-	0.C0797137	-0.73629397	-0.74243814	-0.74248439	-0.74273896	-0.74322474
7	0.82743675	+/-	0.00623813	-0.68370157	-0.68940681	-0.68944979	-0.68968618	-0.69013727
8	0.86624938	+/-	0.00318797	-0.63110912	-0.63637555	-0.63641518	-0.63663340	-0.63704979
9	0.87631249	+/-	0.00395660	-0.57851672	-0.58334422	-0.58338058	-0.58358061	-0.58396232
10	0.89928478	+/-	0.00349412	-0.52592427	-0.53031296	-0.53034598	-0.53052783	-0.53087479
11	0.92002296	+/-	0.00552572	-0.47333187	-0.47728163	-0.47731137	-0.47747505	-0.47778732
12	0.94750106	+/-	0.00550232	-0.42073941	-0.42425036	-0.42427677	-0.42442226	-0.42469984
13	0.97597575	+/-	0.00535607	-0.36814696	-0.37121904	-0.37124217	-0.37136948	-0.37161237
14	0.97354567	+/-	0.00519064	-0.31555456	-0.31818777	-0.31820756	-0.31831670	-0.31852490
15	0.97948796	+/-	0.00472198	-0.26296210	-0.26515645	-0.26517296	-0.26526392	-0.26543736
16	0.97610867	+/-	0.00377265	-0.21036971	-0.21212518	-0.21213835	-0.21221113	-0.21234989
17	0.98010772	+/-	0.00352922	-0.15777725	-0.15909386	-0.15910375	-0.15915835	-0.15926242
18	0.98225969	+/-	0.C0415973	-0.10518485	-0.10606259	-0.10606915	-0.10610557	-0.10617495
19	0.98542905	+/-	0.00458061	-0.05259243	-0.05303130	-0.05303460	-0.05305278	-0.05308748
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.C0376810	0.05259243	0.05303130	0.05303460	0.05305278	0.05308748
22	0.98186535	+/-	0.C0326987	C.10518485	0.10606259	0.10606915	0.10610557	0.10617495
23	0.98517853	+/-	0.00420880	0.15777725	0.15909386	0.15910375	0.15915835	0.15926242
24	0.97912860	+/-	0.00481493	0.21036971	0.21212518	0.21213835	0.21221113	0.21234989
25	0.97057939	+/-	0.00490139	0.26296210	0.26515645	0.26517296	0.26526392	0.26543736
26	0.96084350	+/-	0.00525466	0.31555456	0.31818777	0.31820756	0.31831670	0.31852490
27	0.94119048	+/-	0.00554555	0.36814696	0.37121904	0.37124217	0.37136948	0.37161237
28	0.91906935	+/-	0.00509574	0.42073941	0.42425036	0.42427677	0.42442226	0.42469984
29	0.91350764	+/-	0.00542074	0.47333187	0.47728163	0.47731137	0.47747505	0.47778732
30	0.89249408	+/-	0.00553969	0.52592427	0.53031296	0.53034598	0.53052783	0.53087479
31	0.85914189	+/-	0.00620985	0.57851672	0.58334422	0.58338058	0.58358061	0.58396232
32	0.84589475	+/-	0.00721151	0.63110912	0.63637555	0.63641518	0.63663340	0.63704979
33	0.81060582	+/-	0.00680591	0.68370157	0.68940681	0.68944979	0.68968618	0.69013727
34	0.78447413	+/-	0.00577597	0.73629397	0.74243814	0.74248439	0.74273896	0.74322474
35	0.73478526	+/-	0.C0650398	0.78888643	0.79546940	0.79551899	0.79579175	0.79631221
36	0.68907928	+/-	0.C0965067	0.84147888	C.84850073	0.84855360	0.84884453	0.84939975
37	0.63452137	+/-	0.C0845271	C.89407128	0.90153199	0.90158814	0.90189731	0.90248722
38	0.48173147	+/-	0.00703276	0.94666374	0.95456332	0.95462275	0.95495009	0.95557469
39	0.24655521	+/-	0.C0533949	0.99925613	1.00759411	1.00765705	1.00800228	1.00866127
40	0.0	+/-	0.0	1.05184841	1.06062508	1.06069183	1.06105518	1.06174946

TABLE 3—*Continued*

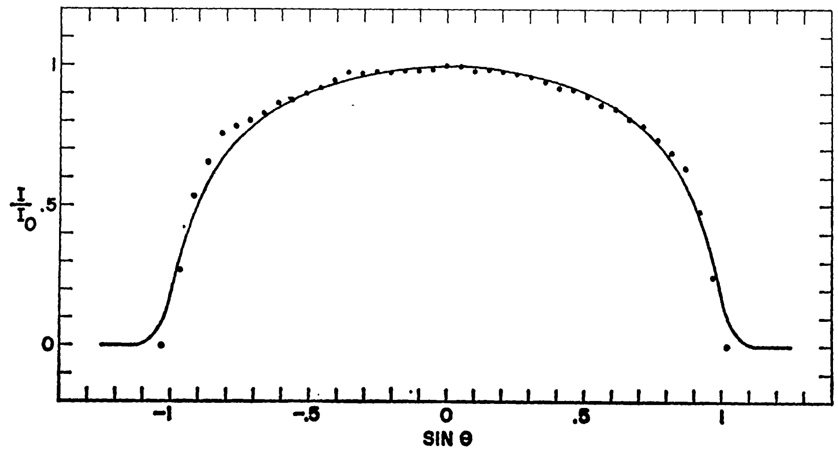
I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000447	0.00085063
11	-1.14999866	0.0	0.0	0.00000000	0.00048234	0.00768441
16	-1.09999847	0.0	0.00000000	0.00017869	0.01155604	0.03827346
21	-1.04999924	0.0	0.04732194	0.05149392	0.08203179	0.12170798
26	-0.99999928	0.0	0.23146665	0.23298502	0.24528211	0.26383156
31	-0.94999933	0.55156606	0.47107905	0.46959251	0.45484573	0.43692929
36	-0.89999932	0.65431499	0.64252269	0.64067858	0.61964864	0.58965689
41	-0.84999931	0.72181016	0.71626621	0.71574080	0.71008664	0.69339210
46	-0.79999930	0.77260369	0.76856244	0.76828444	0.76571417	0.75877565
51	-0.74999928	0.81154734	0.80925572	0.80906612	0.80744553	0.80393368
56	-0.69999933	0.84414291	0.84202528	0.84190911	0.84086174	0.83865297
61	-0.64999932	0.87053436	0.86926478	0.86918712	0.86851096	0.86707050
66	-0.59999931	0.89362562	0.89251947	0.89246619	0.89199626	0.89097464
71	-0.54999930	0.91389251	0.91265082	0.91259915	0.91216576	0.91133595
76	-0.49999928	0.93079805	0.92971772	0.92967510	0.92933059	0.92868274
81	-0.44999933	0.94487774	0.94407254	0.94404984	0.94385189	0.94342977
86	-0.39999932	0.95712298	0.95635962	0.95634758	0.95623726	0.95598751
91	-0.34999931	0.96767372	0.96694195	0.96693295	0.96685386	0.96669495
96	-0.29999930	0.97663635	0.97592884	0.97592396	0.97586614	0.97575784
101	-0.25000000	0.98409581	0.98340672	0.98340470	0.98336530	0.98329246
106	-0.19999961	0.99011779	0.98944408	0.98944217	0.98941749	0.98937196
111	-0.14999962	0.99475288	0.99408954	0.99409044	0.99407434	0.99405020
116	-0.09999943	0.99803853	0.99738240	0.99738342	0.99737382	0.99736446
121	-0.05000019	1.00000000	0.99934655	0.99934804	0.99934363	0.99934167
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99934644	0.99934679	0.99934512	0.99934280
136	0.10000038	0.99803853	0.99738288	0.99738282	0.99737549	0.99736398
141	0.15000057	0.99475288	0.99409008	0.99409109	0.99407458	0.99405020
146	0.19999981	0.99011779	0.98944408	0.98944283	0.98941725	0.98937255
151	0.25000000	0.98409581	0.98340738	0.98340529	0.98336488	0.98329246
156	0.30000019	0.97663635	0.97592926	0.97592211	0.97586739	0.97575819
161	0.35000038	0.96767372	0.96694195	0.96693295	0.96685362	0.96669531
166	0.40000057	0.95712370	0.95636028	0.95635009	0.95623749	0.95598799
171	0.44999981	0.94487774	0.94407254	0.94405359	0.94385147	0.94342989
176	0.50000000	0.93079805	0.92971784	0.92967761	0.92932993	0.92868340
181	0.55000019	0.91389251	0.91265053	0.91260046	0.91216552	0.91133618
186	0.60000038	0.89362562	0.89251989	0.89246809	0.89199960	0.89097643
191	0.65000057	0.87053436	0.86926579	0.86918771	0.86851287	0.86707127
196	0.69999981	0.84414291	0.84202582	0.84190911	0.84086365	0.83865434
201	0.75000000	0.81154734	0.80925626	0.80906993	0.80744618	0.80392957
206	0.80000019	0.77260435	0.76856405	0.76828504	0.76571858	0.75892514
211	0.85000038	0.72181082	0.71626741	0.71574330	0.71021676	0.69422585
216	0.90000057	0.65431571	0.64252555	0.64081222	0.62142307	0.59241527
221	0.94999981	0.55156660	0.47879386	0.47702610	0.46104312	0.44232559
226	1.00000000	0.0	0.23237795	0.23388577	0.24607694	0.26445156
231	1.05000019	0.0	0.04727454	0.05144799	0.08199412	0.12167609
236	1.10000038	0.0	0.00000000	0.00017916	0.01156222	0.03828292
241	1.15000057	0.0	0.0	0.00000000	0.00048429	0.00769704
246	1.19999981	0.0	0.0	0.00000000	0.00000456	0.00085786
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000665

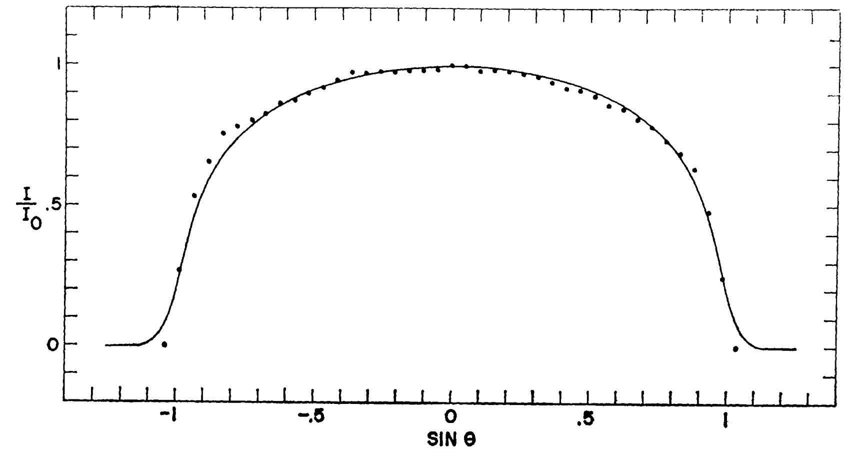
I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-1.00632286	-1.01597786	-1.01603985	-1.01637363	-1.01702309
2	0.53342736	+/-	0.01091558	-0.95335931	-0.96250552	-0.96256447	-0.96288073	-0.96349585
3	0.65479004	+/-	0.00818945	-0.90039492	-0.90903300	-0.90908867	-0.90938735	-0.90996832
4	0.75611269	+/-	0.00561380	-0.84743053	-0.85556048	-0.85561287	-0.85589403	-0.85644078
5	0.78291219	+/-	0.00675163	-0.79446608	-0.80208790	-0.80213702	-0.80240065	-0.80291319
6	0.80480182	+/-	0.00797137	-0.74150169	-0.74861538	-0.74866122	-0.74890727	-0.74938565
7	0.82743675	+/-	0.00623813	-0.68853730	-0.69514287	-0.69518542	-0.69541389	-0.69585812
8	0.86624938	+/-	0.00318797	-0.63557285	-0.64167035	-0.64170963	-0.64192051	-0.64233059
9	0.87631249	+/-	0.00395660	-0.58260846	-0.58819783	-0.58823383	-0.58842713	-0.58880299
10	0.89978478	+/-	0.00349412	-0.52964407	-0.53472525	-0.53475803	-0.53493375	-0.53527546
11	0.92002296	+/-	0.00552572	-0.47667962	-0.48125273	-0.48128223	-0.48144037	-0.48174793
12	0.94750106	+/-	0.00550232	-0.42371523	-0.42778021	-0.42780644	-0.42794698	-0.42822039
13	0.97597575	+/-	0.00535607	-0.37075084	-0.37430769	-0.37433058	-0.37445360	-0.37469280
14	0.97354567	+/-	0.00519064	-0.31778640	-0.32083517	-0.32085478	-0.32096022	-0.32116526
15	0.97948796	+/-	0.00472198	-0.26482201	-0.26736259	-0.26737899	-0.26746684	-0.26763773
16	0.97610867	+/-	0.00377265	-0.21185762	-0.21389008	-0.21390319	-0.21397346	-0.21411020
17	0.98010772	+/-	0.00352922	-0.15889317	-0.16041756	-0.16042739	-0.16048008	-0.16058260
18	0.98225969	+/-	0.00415973	-0.10592878	-0.10694504	-0.10695159	-0.10698670	-0.10705507
19	0.98542905	+/-	0.00458061	-0.05296441	-0.05347253	-0.05347580	-0.05349338	-0.05352755
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05296441	0.05347253	0.05347580	0.05349338	0.05352755
22	0.98186535	+/-	0.00326987	0.10592878	0.10694504	0.10695159	0.10698670	0.10705507
23	0.98517853	+/-	0.00420880	0.15889317	0.16041756	0.16042739	0.16048008	0.16058260
24	0.97912860	+/-	0.00481493	0.21185762	0.21389008	0.21390319	0.21397346	0.21411020
25	0.97057939	+/-	0.00490139	0.26482201	0.26736259	0.26737899	0.26746684	0.26763773
26	0.96084350	+/-	0.00525466	0.31778640	0.32083517	0.32085478	0.32096022	0.32116526
27	0.94119048	+/-	0.00554555	0.37075084	0.37430769	0.37433058	0.37445360	0.37469280
28	0.91906935	+/-	0.00509574	0.42371523	0.42778021	0.42780644	0.42794698	0.42822039
29	0.91350764	+/-	0.00542074	0.47667962	0.48125273	0.48128223	0.48144037	0.48174793
30	0.89249408	+/-	0.00553969	0.52964407	0.53472525	0.53475803	0.53493375	0.53527546
31	0.85914189	+/-	0.00620985	0.58260846	0.58819783	0.58823383	0.58842713	0.58880299
32	0.84589475	+/-	0.00721151	0.63557285	0.64167035	0.64170963	0.64192051	0.64233059
33	0.81060582	+/-	0.00680591	0.68853730	0.69514287	0.69518542	0.69541389	0.69585812
34	0.78447413	+/-	0.00577597	0.74150169	0.74861538	0.74866122	0.74890727	0.74938565
35	0.73478526	+/-	0.00650398	0.79446608	0.80208790	0.80213702	0.80240065	0.80291319
36	0.68907928	+/-	0.00965067	0.84743053	0.85556048	0.85561287	0.85589403	0.85644078
37	0.63452137	+/-	0.00845271	0.90039492	0.90903300	0.90908867	0.90938735	0.90996832
38	0.48173147	+/-	0.00703276	0.95335931	0.96250552	0.96256447	0.96288073	0.96349585
39	0.24655521	+/-	0.00533949	1.00632286	1.01597786	1.01603985	1.01637363	1.01702309
40	0.0	+/-	0.0	1.05928802	1.06945038	1.06951523	1.06986713	1.07055092

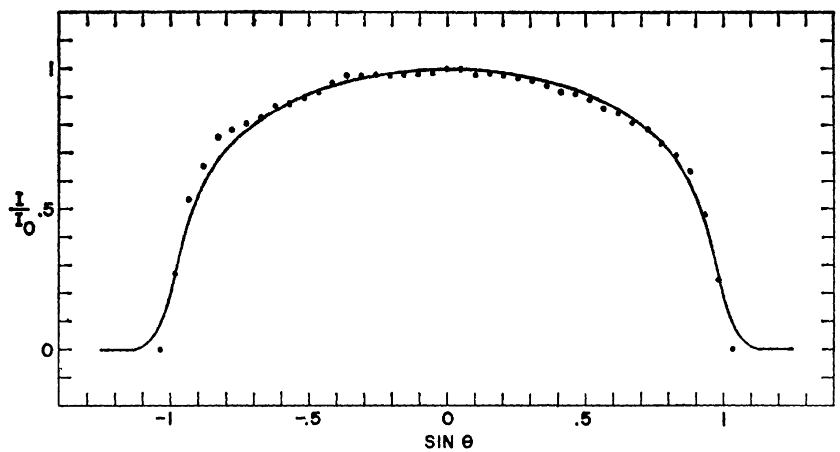
TABLE 3—*Continued*

I	SINE(THETA)	THEORETICAL LIMB DARKENING: WITHOUT CONVOLUTION	APERTURE + SEEING 5	APERTURE + SEEING 4	APERTURE + SEEING 3	APERTURE + SEEING 1-2
1	-1.24999905	0.0	0.0	0.0	0.0	0.0
6	-1.19999886	0.0	0.0	0.00000000	0.00000327	0.00070653
11	-1.14999866	0.0	0.0	0.00000000	0.00037895	0.00663381
16	-1.09999847	0.0	0.00000000	0.00010810	0.00965507	0.03390350
21	-1.04999924	0.0	0.03868622	0.04278193	0.07208115	0.11033273
26	-0.99999928	0.0	0.21054602	0.21220732	0.22563374	0.24583834
31	-0.94999933	0.51701033	0.44263542	0.44145405	0.42932647	0.41479796
36	-0.89999932	0.63003415	0.61686736	0.61492401	0.59483182	0.56690723
41	-0.84999931	0.70357627	0.69740313	0.69681424	0.69067335	0.67390060
46	-0.79999930	0.75845790	0.75402576	0.75371575	0.75086290	0.74339026
51	-0.74999928	0.80032808	0.79783559	0.79762655	0.79582655	0.79192483
56	-0.69999933	0.83526731	0.83292991	0.83279914	0.83163828	0.82918739
61	-0.64999932	0.86330301	0.86195654	0.86187184	0.86112714	0.85953641
66	-0.59999931	0.88783395	0.88666183	0.88660640	0.88609505	0.88497257
71	-0.54999930	0.90936381	0.90802348	0.90796632	0.90749055	0.90657550
76	-0.49999928	0.92723286	0.92607218	0.92602730	0.92564660	0.92493081
81	-0.44999933	0.94203764	0.94119179	0.94116950	0.94095373	0.94049084
86	-0.39999932	0.95491445	0.95411193	0.95409954	0.95398349	0.95371318
91	-0.34999931	0.96600842	0.96523929	0.96522975	0.96514899	0.96497709
96	-0.29999930	0.97543275	0.97468913	0.97468454	0.97462624	0.97450781
101	-0.25000000	0.98327667	0.98255235	0.98254967	0.98251009	0.98243129
106	-0.19999981	0.98960912	0.98890054	0.98889834	0.98887318	0.98882419
111	-0.14999962	0.99448311	0.99378556	0.99378645	0.99377126	0.99374348
116	-0.09999943	0.99793774	0.99724787	0.99724674	0.99724066	0.99722815
121	-0.05000019	1.00000000	0.99931288	0.99931377	0.99931192	0.99930817
126	0.0	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
131	0.05000019	1.00000000	0.99931288	0.99931258	0.99931294	0.99930769
136	0.10000038	0.99793774	0.99724841	0.99724793	0.99724185	0.99722803
141	0.15000057	0.99448311	0.99378568	0.99378467	0.99377143	0.99374312
146	0.19999981	0.98960912	0.98890054	0.98889774	0.98887396	0.98882455
151	0.25000000	0.98327667	0.98255259	0.98254609	0.98251027	0.98243141
156	0.30000019	0.97543275	0.97468936	0.97468334	0.97462565	0.97450817
161	0.35000038	0.96600842	0.96523893	0.96522915	0.96514821	0.96497732
166	0.40000057	0.95491445	0.95411217	0.95410073	0.95398331	0.95371413
171	0.44999981	0.94203764	0.94119233	0.94116950	0.94095409	0.94049096
176	0.50000000	0.92723286	0.92607254	0.92602611	0.92564565	0.92493105
181	0.55000019	0.90936381	0.90802395	0.90796751	0.90749133	0.90657669
186	0.60000038	0.88783395	0.88666260	0.88660759	0.88609684	0.88497388
191	0.65000057	0.86330372	0.86195695	0.86187065	0.86112875	0.85953712
196	0.69999981	0.83526731	0.83293045	0.83280033	0.83163905	0.82918835
201	0.75000000	0.80032808	0.79783547	0.79762834	0.79582775	0.79192305
206	0.80000019	0.75845861	0.75402761	0.75371575	0.75086486	0.74347067
211	0.85000038	0.70357698	0.69740552	0.69681484	0.69074219	0.67433339
216	0.90000057	0.63003486	0.61686951	0.61499393	0.59574491	0.56832379
221	0.94999981	0.51701099	0.44654214	0.44521844	0.43246490	0.41753161
226	1.00000000	0.0	0.21126252	0.21291566	0.22625947	0.24632579
231	1.05000019	0.0	0.03864702	0.04274388	0.07205003	0.11030638
236	1.10000038	0.0	0.00000000	0.00010847	0.00966024	0.03391149
241	1.15000057	0.0	0.0	0.00000000	0.00038055	0.00664424
246	1.19999981	0.0	0.0	0.00000000	0.00000335	0.00071234
251	1.25000000	0.0	0.0	0.0	0.00000000	0.00000347

I	OBSERVATIONAL LIMB DARKENING			SINE(THETA)	BEST-FIT SCALING OF OBSERVATIONS TO ABOVE THEORY: SINE(THETA)	SINE(THETA)	SINE(THETA)	SINE(THETA)
1	0.27073383	+/-	0.00996722	-0.99805462	-1.00602245	-1.00608921	-1.00643063	-1.00708961
2	0.53342736	+/-	0.01091558	-0.94552547	-0.95307416	-0.95313722	-0.95346093	-0.95408499
3	0.65479004	+/-	0.00818945	-0.89299625	-0.90012556	-0.90018517	-0.90049088	-0.90108025
4	0.75611269	+/-	0.00561380	-0.84046710	-0.84717703	-0.84723312	-0.84752083	-0.84807557
5	0.78291219	+/-	0.00675163	-0.78793788	-0.79422843	-0.79428101	-0.79455078	-0.79507083
6	0.80480182	+/-	0.00797137	-0.73540866	-0.74127990	-0.74132895	-0.74158072	-0.74206609
7	0.82743675	+/-	0.00623813	-0.68287951	-0.68833131	-0.68837690	-0.68861067	-0.68906134
8	0.86624938	+/-	0.00318797	-0.63035029	-0.63538277	-0.63542479	-0.63564062	-0.63605666
9	0.87631249	+/-	0.00395660	-0.57782108	-0.58243418	-0.58247274	-0.58267057	-0.58305192
10	0.89928478	+/-	0.00349412	-0.52529192	-0.52948564	-0.52952069	-0.52970052	-0.53004718
11	0.92002296	+/-	0.00552572	-0.47276270	-0.47653705	-0.47656858	-0.47673047	-0.47704250
12	0.94750106	+/-	0.00550232	-0.42023355	-0.42358851	-0.42361653	-0.42376041	-0.42403775
13	0.97597575	+/-	0.00535607	-0.36770433	-0.37063992	-0.37066448	-0.37079036	-0.37103301
14	0.97354567	+/-	0.00519064	-0.31517512	-0.31769139	-0.31771237	-0.31782031	-0.31802833
15	0.97948796	+/-	0.00472198	-0.26264596	-0.26474279	-0.26476032	-0.26485026	-0.26502359
16	0.97610867	+/-	0.00377265	-0.21011674	-0.21179426	-0.21180826	-0.21188021	-0.21201885
17	0.98010772	+/-	0.00352922	-0.15758753	-0.15884566	-0.15885615	-0.15891016	-0.15901417
18	0.98225969	+/-	0.00415973	-0.10505837	-0.10589713	-0.10590410	-0.10594010	-0.10600942
19	0.98542905	+/-	0.00458061	-0.05252919	-0.05294856	-0.05295207	-0.05297005	-0.05300472
20	1.00000000	+/-	0.00369757	0.0	0.0	0.0	0.0	0.0
21	0.99866104	+/-	0.00376810	0.05252919	0.05294856	0.05295207	0.05297005	0.05300472
22	0.98186535	+/-	0.00326987	0.10505837	0.10589713	0.10590410	0.10594010	0.10600942
23	0.98517853	+/-	0.00420880	0.15758753	0.15884566	0.15885615	0.15891016	0.15901417
24	0.97912860	+/-	0.00481493	0.21011674	0.21179426	0.21180826	0.21188021	0.21201885
25	0.97057939	+/-	0.00490139	0.26264596	0.26474279	0.26476032	0.26485026	0.26502359
26	0.96084350	+/-	0.00525466	0.31517512	0.31769139	0.31771237	0.31782031	0.31802833
27	0.94119048	+/-	0.00554555	0.36770433	0.37063992	0.37066448	0.37079036	0.37103301
28	0.91906935	+/-	0.00509574	0.42023355	0.42358851	0.42361653	0.42376041	0.42403775
29	0.91350764	+/-	0.00542074	0.47276270	0.47653705	0.47656858	0.47673047	0.47704250
30	0.89249408	+/-	0.00553969	0.52529192	0.52948564	0.52952069	0.52970052	0.53004718
31	0.85914189	+/-	0.00620985	0.57782108	0.58243418	0.58247274	0.58267057	0.58305192
32	0.84589475	+/-	0.00721151	0.63035029	0.63538277	0.63542479	0.63564062	0.63605666
33	0.81060582	+/-	0.00680591	0.68287951	0.68833131	0.68837690	0.68861067	0.68906134
34	0.78447413	+/-	0.00577597	0.73540866	0.74127990	0.74132895	0.74158072	0.74206609
35	0.73478526	+/-	0.00650398	0.78793788	0.79422843	0.79428101	0.79455078	0.79507083
36	0.68907928	+/-	0.00965067	0.84046710	0.84717703	0.84723312	0.84752083	0.84807557
37	0.63452137	+/-	0.00845271	0.89299625	0.90012556	0.90018517	0.90049088	0.90108025
38	0.48173147	+/-	0.00703276	0.94552547	0.95307416	0.95313722	0.95346093	0.95408499
39	0.24655521	+/-	0.00533949	0.99805462	1.00602245	1.00608921	1.00643063	1.00708961
40	0.0	+/-	0.0	1.05058384	1.05897045	1.05904102	1.05940056	1.06009388







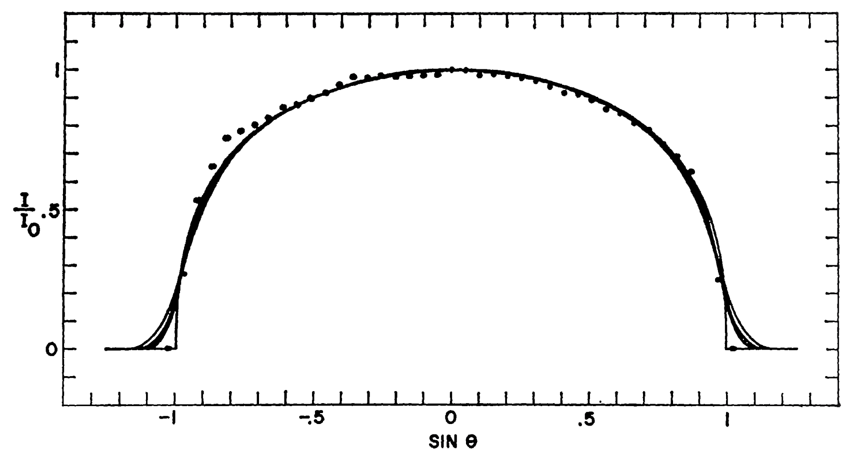


FIG. 4 (*top left*).—Observational-theoretical comparison of Jupiter's 8–14-μ limb darkening for $T_e = 135°$, $He/H_2 = 0$, and nominal seeing.

FIG. 5 (*top right*).—Same as Figs. 3 and 4 except for $T_e = 140°$ and $He/H_2 = 1$.

FIG. 6 (*bottom left*).—Same as Fig. 5 but for $T_e = 140°$ and $He/H_2 = 0$.

FIG. 7 (*bottom right*).—Observational-theoretical comparison of Jupiter's thermal limb darkening paired for instrumental smear plus different values of astronomical seeing (1–2, 3, 4, 5) and one case of infinite resolution. The authors' calibration of the seeing scale may be somewhat subjective. The actual values of σ assumed in the Gaussian function in units of the Jovian radius are 0.0036, 0.012, 0.036, and 0.060. The radius of the photometer aperture is 0.07915.

much as the limb-darkening asymmetry is real, the scaling procedure ought perhaps to be applied to the area between the western limb and the center of the disk, rather than to the entire limb-darkening curve. This would make the fit between theory and observation even better than shown in Figures 3–6. In this connection it is also worth emphasizing that any method which scales the observations independently for each model comparison will minimize rather than maximize distinctions in goodness of fit between the various models. The general agreement of our value of T_e with that of Aumann, Gillespie, and Low (1969) of $134° \pm 4°$ K as determined by direct bolometry of the whole disk is support for the assumptions in the model atmosphere. These temperatures are well above those expected on the basis of solar heating alone, and the near equality of the equatorial and whole-disk values is additional support for the existence of a significant internal source of heat.

According to Gierasch and Goody (1969) the radiative time constants deep in Jupiter's atmosphere are long compared with probable dynamical ones. Nevertheless, the upper atmosphere must be in local radiative equilibrium (Trafton and Münch 1969). Observational evidence for a significant depth in Jupiter's equatorial zone to which radiative equilibrium holds is contained in the figures, which show that the radiative models fit the observations very well except for an isolated zone near the eastern limb. Because the mean depth of formation of the observed 8–14-μ radiation lies at a Planck mean optical depth of unity in the thermal spectrum, radiative equilibrium is the rule rather than the exception, at least to depths of $\tau \sim 1$.

The disturbance near the eastern limb may represent the penetration of a deeper dynamical disturbance to the layers of the 8–14-μ emission. If dynamical, however, it is apparently coupled to the diurnal insolation because the observational limb darkening derived in the present study represents the averages of many scans over several months in which transient phenomena were rejected. The flux in this bulge is otherwise difficult to explain.

Although we offer no confident explanation for the sharp shoulder on the Eastern limb, we note that it may represent a solar induced non-LTE transient phenomenon close to Jovian sunrise and that the decay of this effect justifies our model fitting on the afternoon-sunset limb while ignoring the discrepancy on the morning-sunrise limb. The very much larger number of observations rejected on the morning half of the disk compared to the afternoon half is undoubtedly significant. The disturbance may bear some physical relationship to the phenomenon of increased thermal radiation from regions of Jupiter's atmosphere shadowed by the Galilean satellites, although that phenomenon was unobservable during the apparition under investigation (Wildey 1966*b*).

The effective temperature favored here is approximately 10° K lower than that favored in our preliminary report. This is because (*a*) we earlier treated only the eastern limb of Jupiter in our comparison and (*b*) the original method of allowing for the back-warming effect of the rotational NH_3 band (at layers in the model where the temperature was high enough to cause significant rotational NH_3 absorption above the layer, the τ_ν was multiplied by a factor of 20 for all frequencies lying in the rotational band and the model was then run to constant flux) was a crude overestimate.

In summary, these 1965 opposition observations imply that, over Jupiter's equatorial region, departures from radiative equilibrium are events isolated in space and time. Dynamics apparently plays a secondary role to radiative equilibrium in determining Jupiter's atmospheric structure above the $\tau = 1$ level. Furthermore, the effective temperature implied by the limb darkening at 10 μ is in good agreement with the direct bolometric measurement.

The permission of Dr. H. W. Babcock to use the 200-inch Hale telescope in collecting these observations is gratefully acknowledged. This investigation has been supported in part by the National Aeronautics and Space Administration under contract W-12872.

REFERENCES

Aumann, H. H., Gillespie, C. M., and Low, F. J. 1969, *Ap. J.* (*Letters*), **159**, L69.
Curtis, A. R. 1952, *Quant. J. Roy. Meteorol. Soc.*, **78**, 636.
France, W. L., and Williams, D. 1966, *J. Opt. Soc. Am.*, **56**, 70.
Garing, J. S., Nielson, H. H., and Rao, K. N. 1959, *J. Molecular Spectrosc.*, **3**, 496.
Gierasch, P. J., and Goody, R. M. 1969, *J. Atm. Sci.*, **26**, 979.
Gille, J. C., and Lee, T.-H. 1969, *J. Atm. Sci.*, **26**, 932.
Godson, W. L. 1953, *Quant. J. Roy. Meteorol. Soc.*, **79**, 367.
Goetz, A. F. H. 1967, Ph.D. thesis in planetary science, California Institute of Technology.
Goody, R. M. 1964, *Atmospheric Radiation* (Oxford: Oxford University Press.), Vol. **1**.
Ladenburg, R. W., and Reiche, F. 1913, *Ann. Phys.*, **42**, 181.
Legan, R. L., Roberts, J. A., Rinehart, E. A., and Lin, C. C. 1965, *J. Chem. Phys.*, **43**, 4337.
Mould, H. M., Price, W. C., and Wilkinson, G. R. 1959, *Spectrochim. Acta*, **15**, 314.
Sinton, W. M., and Strong, J. 1960, *Ap. J.*, **131**, 459.
Townes, C. H., and Schawlow, A. L. 1955, *Microwave Spectroscopy* (New York: McGraw-Hill Book Co.), chaps. 12–13.
Trafton, L. M. 1967, *Ap. J.*, **147**, 765.
———. 1970, unpublished work.
Trafton, L. M., and Münch, G. 1969, *J. Atm. Sci.*, **26**, 813.
Trafton, L. M., and Wildey, R. L. 1969, *I.A.U. Symposium No. 40*, paper presented at Marfa, Texas October 1969, proceedings in press.
———. 1970, *Science*, **168**, 1214.
Wildey, R. L. 1966*a*, *Zs. f. Ap.*, **64**, 32.
———. 1966*b*, *Ap. J.*, **144**, 1241.
———. 1968, *Ap. J.*, **154**, 761.