cycle, and can be represented by a set of single-line spectroscopic elements with $K = 437$ km/sec and $e = 0.09$. The velocity variation proceeds in synchronization with the light cycle; spectroscopic conjunction, with the emission-line star behind, occurs just after the steep decline from maximum light.

It appears that the observational information now available on VV Puppis can be explained in terms of the star being an eclipsing system of rather unusual properties, as well as the binary of shortest known period. The system is pictured as composed of a dark component plus a larger, brighter star which has widespread surface activity responsible for the emission lines. The following side of the larger star also contains a bright, hot area which produces the strong continuous spectrum. The system is at maximum light when the "hot spot" is seen approximately centrally on the disc, but when the secondary star moves across, the hot spot is quickly covered. But when the geometrical eclipse is over, the hot area has vanished around the limb so that the system remains faint until the fringe of the hot area comes around the opposite limb. The brightness then rises slowly as more and more of the hot area is exposed. This accounts for the long "minimum" which lasts over half the cycle.

On this interpretation, the secular change in the brightness of the system is due to intrinsic variation in the brightness of the larger star. The cycle-to-cycle changes in the light curve must be largely due to variation in the size and brightness of the hot area.

One of the interesting features of the system of VV Puppis is that, contrary to what one might expect, the masses are not extremely small. The spectroscopic mass function sets a lower limit on the mass of the fainter star, about 0.6 $\odot$. If the two components are of equal mass, both would have values of about 2.4 $\odot$. The system is similar in many respects to UX Ursae Majoris, DQ Herculis, and RW Trianguli.

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HUFFER, C. M. AND CODE, A. D. **A three-color study of the stream-of-gas star U Cephei.**

Among the first observations with the new 36-inch telescope of the Pine Bluff Station of the Washburn Observatory were photoelectric measures of the well-known eclipsing binary star U Cephei. On September 9, 1958, the first observations of the primary eclipse in three colors showed marked changes from totality to maximum light. This was to be expected because of the spectral types of the two components—B8 and G8 III.

At maximum the B8 star dominates and the blue deflections are greater than the other two. The yellow and ultraviolet deflections are nearly equal. During totality, the blue light decreases to less than the yellow and the ultraviolet light is almost zero.

As shown by two-color photometry in 1950 and 1951, the light-curve of the primary eclipse was unsymmetrical on the two sides. This is assumed to be caused by a stream of gas. Assuming that the up-curve is not affected by the gas and a darkening coefficient, $u = 0.4$, a ratio of the radii of the two stars, $k = 0.582$, was derived.

It is hoped that a comparison of the down-curve with the up-curve will permit a study of the character of the stream of gas. The two branches of the light-curve during the primary eclipse will be compared in the three colors directed toward a determination of the differential limb darkening. It is also hoped to observe eclipses of this star in the region of the Balmer limit.

Light-curves of primary eclipse in three colors are shown; also a plot showing the change in color, yellow minus blue and yellow minus ultraviolet.

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JACCHIA, LUIGI G. **Atmospheric fluctuations of solar origin revealed by artificial satellites.**

Atmospheric drag progessively shortens the orbital periods of artificial satellites. The decrease in period shows fluctuations which cannot be accounted for by gravitational theory. In 1957 $\beta 1$ the fluctuations were rather irregular in nature, but in 1958 $\beta 2$ and 1958 $\delta 1$ they distinctly showed the presence of 27-day cycles and were essentially synchronous. Isolated maxima and minima determined for 1958α, 1958ϵ and 1958γ indicate that also for these three satellites the fluctuations must have been in unison with the others. The rather obvious hypothesis that these fluctuations are due to a density variation of the upper atmosphere caused by variable solar radiation is confirmed by the nearly perfect parallelism of the satellite acceleration curves on one hand and the 10.7-cm solar-flux curve on the