One problem, the initial one, was that the sidereal period could not be well-defined. Slivan (2012, 2013) discussed the issues involved in finding a unique sidereal period using an analytical approach. Anyone attempting modeling should keep these two papers at hand. As mentioned before, sparse data are of best use when the noise (scatter) is not a significant fraction of the asteroid's lightcurve amplitude (see, e.g., Durech *et al.*, 2011; Hanus and Durech, 2012).

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ROTATION PERIOD OF 227 PHILOSOPHIA IS RE-EVALUATED

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We previously published a rotation period of 52.98 hours for 227 Philosophia (Pilcher and Alkema, 2014, *Minor Planet Bulletin* **41**, 188). By adjusting instrumental magnitudes of the observations reported there by 0.03 or less, we obtain equally good fits to 26.476 hours with a monomodal lightcurve and 52.955 hours with a bimodal lightcurve, amplitude 0.12 magnitudes. We prefer the shorter period because the two sides of the longer period lightcurve are nearly identical.

Earlier period determinations for 227 Philosophia are by Bembrick et al. (2006), 18.048 hours; Behrend (2006), 26.138 hours; Alkema (2013), 17.181 hours. In a lightcurve far more dense than any previously obtained, we (Pilcher and Alkema, 2014) reported a rotation period of 52.98 hours, with a slightly asymmetric bimodal lightcurve. By adjusting the instrumental magnitudes of the observations reported in this reference by 0.03 or less, we find equally good fits to 26.476 hours with a monomodal lightcurve (Figure 1) and 52.955 hours with a very symmetric bimodal lightcurve (Figure 2). A symmetric bimodal lightcurve can be produced only by an object whose shape is highly symmetric over a 180 degree rotation. This is unlikely for a real asteroid. We therefore prefer the 26.476 hour period, although the longer period cannot be ruled out. The formal error of ± 0.001 hours is unrealistic. We believe the real error is probably near ± 0.01 hours, or even larger.

The data obtained by Alkema (2013) provided a good fit to a nearly symmetric bimodal lightcurve of period 53.12 hours, although with incomplete phase coverage, and published by Pilcher and Alkema (2014). Following an instrumental magnitude adjustment, we are able to provide a good fit of these data to a monomodal lightcurve with period 26.560 hours (Figure 3), compatible with the 26.476 hours found in the more dense lightcurve.

Future work. It often occurs that an asteroid with a monomodal lightcurve at some oppositions has a bimodal lightcurve at a subsequent opposition at a different celestial longitude. We recommend that 227 Philosophia be observed at a future opposition. We can be fully confident that the period is near either 26.5 hours or 53 hours. The observer at the future opposition needs only to look for possible bimodal behavior in a 26.5 hour lightcurve. Its presence will definitively resolve the ambiguity in the current period determination, but if the bimodal behavior at 26.5 hours is absent, the period will still be ambiguous. Dates and declinations of future maximum elongations from the Sun are: 2015 Apr. 30, -28 degrees, southern hemisphere observers please

take note; 2016 Aug. 23, -10 degrees; 2017 Oct. 25, +22 degrees; 2018 Dec. 26, +34 degrees.

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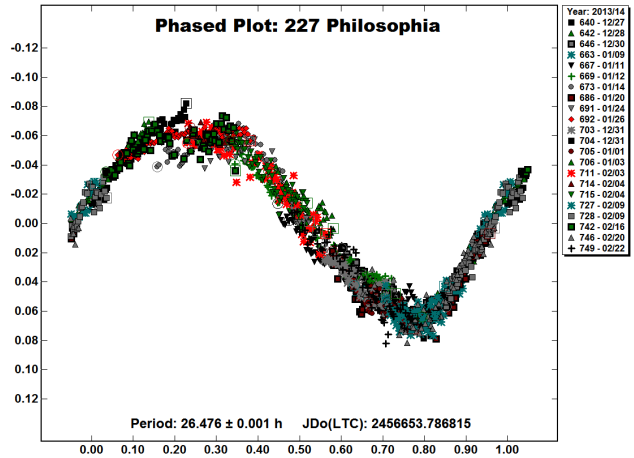

Figure 1. Observations of 227 Philosophia 2013 12 27 - 2014 02 22 phased to a period 26.476 hours with one maximum and minimum per cycle.

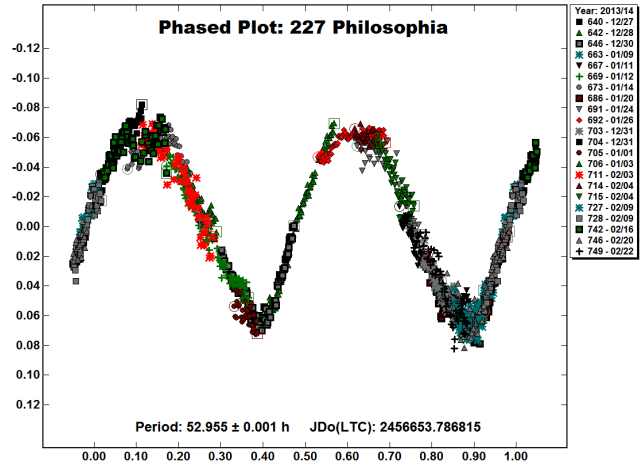

Figure 2. Observations of 227 Philosophia 2013 12 27 - 2014 02 22 phased to a period 52.955 hours with two nearly identical maxima and minima per cycle.

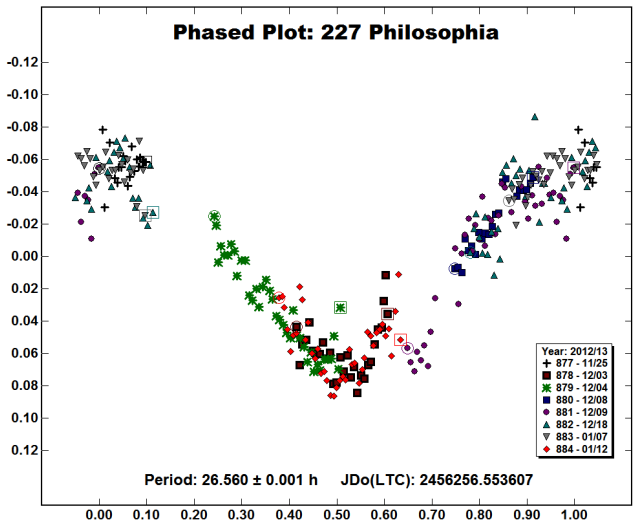

Figure 3. Observations of 227 Philosophia 2012 11 25 - 2013 01 12 phased to a period 26.560 hours with one maximum and minimum per cycle.