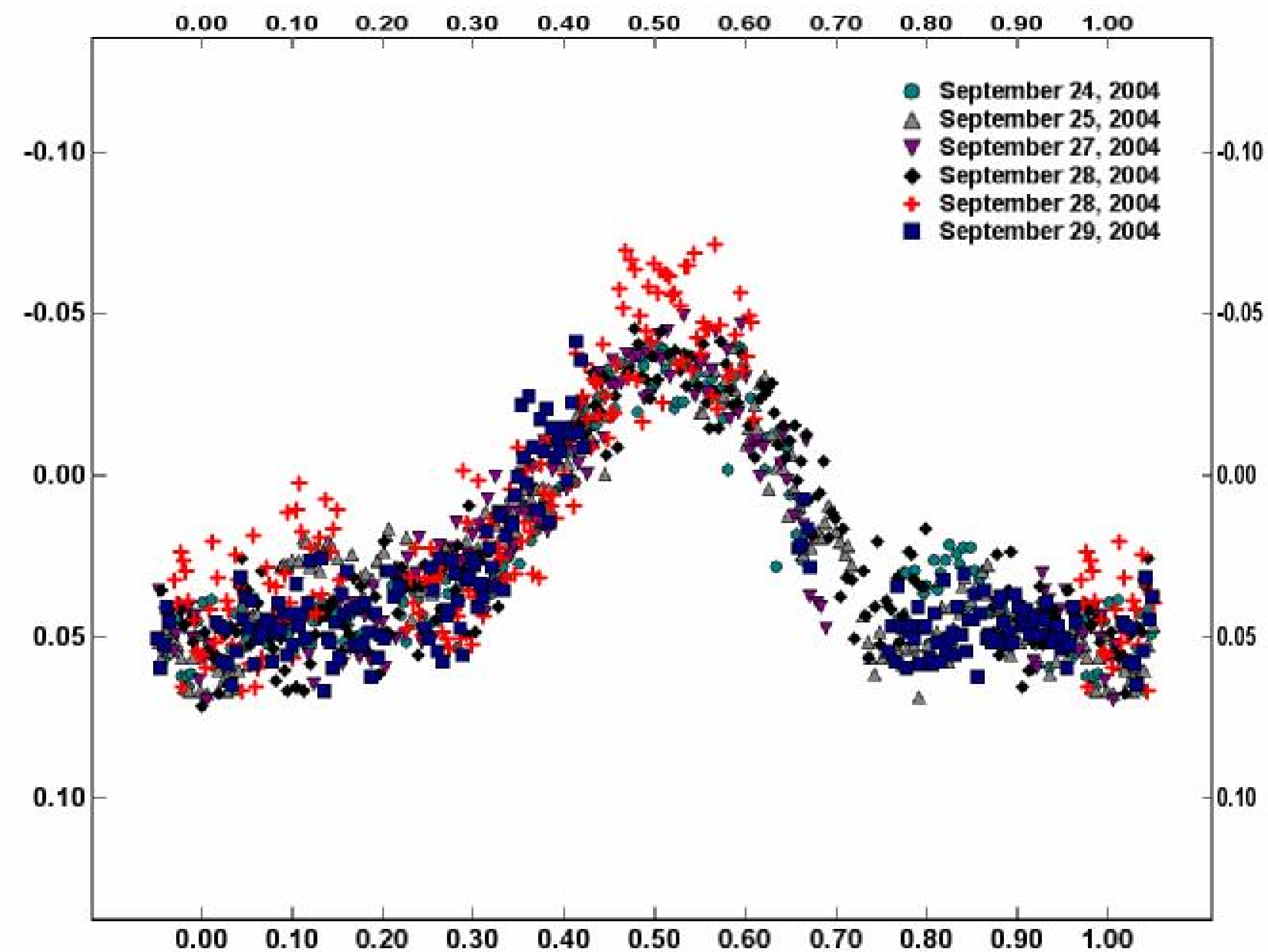
690 Wratislavia



Period: 8.64 ± .01
Amplitude: .12 ± .03

Dates Observed: November 24 to December 4, 2004
Number of Sessions: 4 (Stephens), 2 Durkee
Number of Observations: 711 (Stephens)

Instruments: .35 meter F/11 SCT with a SBIG ST1001e CCD Camera
.25 meter F/10 Durkee

Discovered: Discovered October 16, 1909 by J. H. Metcalf at Taunton. It is named for the city of Bresau in the province of Silesia.

Discussion: Wratislavia has a prior history of observations with many different period solutions. Gil-Hutton (1988) reported observations of Wratislavia on three nights in September 1987, totaling 96 photometric measurements. His composite lightcurve had a period of 6.31 hours and showed only one maximum and one minimum. Gil-Hutton (1995) reported additional observations from July 6, 1992 yielding a partial lightcurve with two unequal maxima separated by 5.2 hours. He reported that the 6.31 hour period was not correct but the 9.9 or 12.6 hour periods were possible. Denchev (2000) reported that Wratislavia had a 9.909 hour period. Sada (2000) observed Wratislavia on five nights between December 6 and 14, 1999. He used 150 observations to determine that the asteroid had a 8.60 ± 0.01 hour period. His composite lightcurve had two very similar maxima and minima.

Our 2004 composite lightcurve was very difficult to resolve. Initially, it showed bimodal maxima with flattened and extended minima exhibiting rough, but repeating features using a 17.23 hour solution. Even though several of the individual sessions were approximately 8 hours in length, no individual session detected more than one maximum. However, the shape of the lightcurve was troubling in that it displayed two identical maxima separated by identical flattened minima; a solution that seemed unlikely. Since this solution was twice the Sada period, a period of 8.62 hours with a single set of extrema was explored. We could not distinguish between the 8.62 and 17.23 hour periods using the Noise Spectrum of the fit in the Fourier Analysis routine, so we decided to re-fit the 1987 Gill-Hutton and 1988 Denchev data to see if it is consistent with the 8.62 hour period.

Our rephasing of those lightcurves shows that the Gil-Hutton data had an amplitude of just over 0.1 magnitudes. The resulting lightcurve is consistent with a 8.64 hour period, has one set of extrema, and is similar in shape to the Stephens-Durkee lightcurve. Rephasing the Denchev lightcurve was consistent with either a 8.603 or 8.642 hour periods. With the exception of a single observation on September 25, 1998 the shape of the lightcurve is similar to the Gil-Hutton lightcurve and the Stephens-Durkee lightcurve. Because of the two-month span of data, the Denchev period is more precise, but ambiguous as to which of the two periods is correct.

Gil-Hutton's reported 1992 observations had an amplitude of 0.3 magnitudes. However, he reported an equipment problem in mid-run and the amplitude could be as little ass 0.2 magnitude. The 1999 Denchev observations had an amplitude of 0.1 magnitude. This implies that Sada's 1999 observations are closest to being equatorial and the Stephens-Durkee observations are the closest to pole-on, consistent with the low amplitude and the singly periodic lightcurve. In conclusion, the Stephens-Durkee period of 8.64 hours is similar the Sada period of 8.60 hours, but is not quite within the error bars of both sets of observations. Rephasing the Gil-Hutton period is consistent with this period and the Denchev observations could fit either a 8.603 or 8.642 period.

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