Individual sessions spanned the complex section of the curve ruling out any trimodal or monomodal fit. Due to weather problems, only about 85% phase coverage could be obtained. However, I believe this period to be secure because the only shape that can produce a lightcurve with an amplitude as large as 0.40 magnitudes is an elongated body that features two maxima and minima per cycle that are nearly symmetrically placed.

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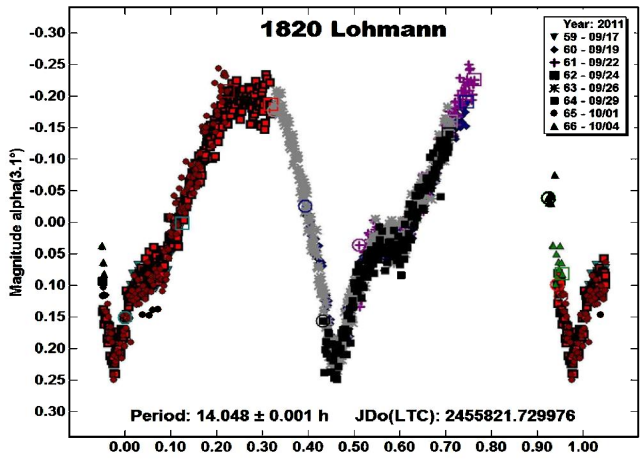
References

Schmadel, L.D. (2003). Dictionary of minor planets. (5th ed., p. 146). New York: Springer.

Warner, B.D. (2011). "Potential Lightcurve Targets 2011 July 1 – September 30."
*http://www.minorplanet.info/CALL/targets_2011_Q3.htm*

Warner, B.D. (2011). MPO Software, Canopus version 10.4.0.4 Bdw Publishing.
*http://minorplanetobserver.com*




## ASTEROID LIGHTCURVE ANALYSIS AT THE OAKLEY SOUTHERN SKY OBSERVATORY: 2011 APRIL–MAY

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Photometric data for 19 asteroids were collected over 21 nights during 2011 April and May at the Oakley Southern Sky Observatory. The asteroids observed included: 518 Halawe, 828 Lindemannia, 999 Zachia, 1305 Pongola, 1359 Prieska, 1858 Lobachevskij, 2008 Konstitutsiya, 2141 Simferopol, 2271 Kiso, 2691 Sersic, 2776 Baikal, 2841 Puijo, 2931 Mayakovsky, 3031 Houston, 3044 Saltykov, 3181 Ahnert, 3248 Farinella, 4362 Carlisle, and 5092 Manara.

Nineteen asteroids were observed from the Oakley Southern Sky Observatory near Coonabarabran, New South Wales, Australia on the nights of 2011 April 22-30, May 1, May 3-7, May 9-10, and May 25-28. From these images, we were able to find lightcurves for eight asteroids. Of those eight, six were previously unrecorded results. Our result for one asteroid was reasonably close to the already published period, but the other was significantly different.

The selection of asteroids was based on their sky position approximately one hour after sunset. Asteroids without previously published lightcurves were given higher priority than asteroids with known periods. Asteroids with uncertain periods were also selected with the hope that we would be able to improve earlier results. We used an RC Optical, 20-inch Ritchey-Chretien optical tube assembly mounted on a Paramount ME. The camera was a Santa Barbara Instrument Group STL-1001E with a clear filter. The image scale was 1.2 arcseconds per pixel at f/8.3. Calibration of the images was done using master twilight flats, darks, and bias frames. All calibration frames were created using *CCDSoft*. *MPO Canopus* was used to measure the processed images and complete the period analysis of the asteroids' lightcurves.

As far as we are aware, these are the first reported lightcurve and period determinations for asteroids 518 Halawe, 2008 Konstitutsiya, 2141 Simferopol, 2931 Mayakovsky, 3031 Houston, and 3248 Farinella. Our data for 828 Lindemannia, 999 Zachia, 1359 Prieska, 2271 Kiso, 2691 Sersic, 2776 Baikal, 2841 Puijo, 3044 Saltykov, 3181 Ahnert, 4362 Carlisle, and 5092 Manara were too noisy to determine their periods. Supporting lightcurve plots are included. Results from all of the asteroids are listed in the table below. Additional comments have been included as needed.

999 Zachia. We were unable to confirm the period of 22.77 ± 0.03 h found by Warner (2000).

1305 Pongola. Our results are within experimental uncertainty of the period of 8.03 ± 0.10 h found by Binzel (1987).

1858 Lobachevskij. Our current results are not compatible with the period of 7.00 ± 0.01 h reported by Ditteon (2002). However, the data from 2002 were reexamined and found to fit a period of 5.435 ± 0.009 h, which is close to our new value. In addition to the plot of the current data, a plot of the reexamined data is also included.

2841 Puijo. We were unable to confirm the period of 3.545 ± 0.005 h found by Warner (2004).

| Number | Name | Dates (mm/dd 2011) | Data Points | Period (h) | Error (h) | Amp (mag) | Err (mag) |
|---|---|---|---|---|---|---|---|
| 518 | Halawe | 5/1, 5/3 - 5/6, 5/9, 5/10 | 141 | 14.310 | 0.002 | 0.50 | 0.03 |
| 828 | Lindemannia | 5/1, 5/3 - 5/7, 5/9, 5/10 | 139 | | | 0.08 | 0.04 |
| 999 | Zachia | 5/25 - 5/28 | 65 | | | 0.04 | 0.04 |
| 1305 | Pongola | 5/25 - 5/28 | 82 | 8.06 | 0.02 | 0.14 | 0.04 |
| 1359 | Prieska | 5/25 - 5/28 | 74 | | | 0.04 | 0.04 |
| 1858 | Lobachevskij | 5/25 - 5/28 | 73 | 5.413 | 0.003 | 0.30 | 0.03 |
| 2008 | Konstitutsiya | 4/22 - 4/30 | 178 | 11.279 | 0.009 | 0.06 | 0.02 |
| 2141 | Simferopol | 4/22 - 4/30 | 200 | 14.956 | 0.003 | 0.48 | 0.03 |
| 2271 | Kiso | 5/1, 5/3 - 5/7, 5/9, 5/10 | 102 | | | 0.12 | 0.04 |
| 2691 | Sersic | 5/25 - 5/28 | 93 | | | 0.20 | 0.04 |
| 2776 | Baikal | 5/1, 5/3 - 5/6, 5/9, 5/10 | 141 | | | 0.04 | 0.04 |
| 2841 | Puijo | 5/25 - 5/28 | 74 | | | 0.10 | 0.04 |
| 2931 | Mayakovsky | 4/22 - 4/23, 4/25 - 4/30 | 149 | 37.38 | 0.05 | 0.14 | 0.02 |
| 3031 | Houston | 4/22 - 4/23, 4/25 - 4/30 | 186 | 11.218 | 0.006 | 0.11 | 0.04 |
| 3044 | Saltykov | 5/25 - 5/28 | 77 | | | 0.04 | 0.04 |
| 3181 | Ahnert | 5/1, 5/3 - 5/7, 5/9, 5/10 | 137 | | | 0.08 | 0.04 |
| 3248 | Farinella | 4/22 - 4/23, 4/25 - 4/30 | 147 | 6.676 | 0.002 | 0.20 | 0.04 |
| 4362 | Carlisle | 4/22 - 4/30 | 186 | | | 0.10 | 0.04 |
| 5092 | Manara | 5/1, 5/3 - 5/7, 5/9, 5/10 | 101 | | | 0.10 | 0.04 |

Table I. Observing circumstances.


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## References


Binzel, R.P. (1987). "A Photoelectric Survey of 130 Asteroids." *Icarus,* **72**, 135-208.

Ditteon, R., Bixby, A.R., Sarros, A.M., and Waters, C.T. (2002). "Rotational Periods and Lightcurves of 1858 Lobachevskij, 2384 Schulhof, and (5515) 1989 EL1," *Minor Planet Bul.* **29**, 85-88.

Warner, B.D. (2000). "Asteroid Photometry at the Palmer Divide Observatory." *Minor Planet Bul.* **27**, 4-6.

Warner, B.D. (2004). "Lightcurve Analysis for Numbered Asteroids 863, 903, 907, 928, 977, 1386, 2841, and 75747." *Minor Planet Bul.* **31**, 85-88.