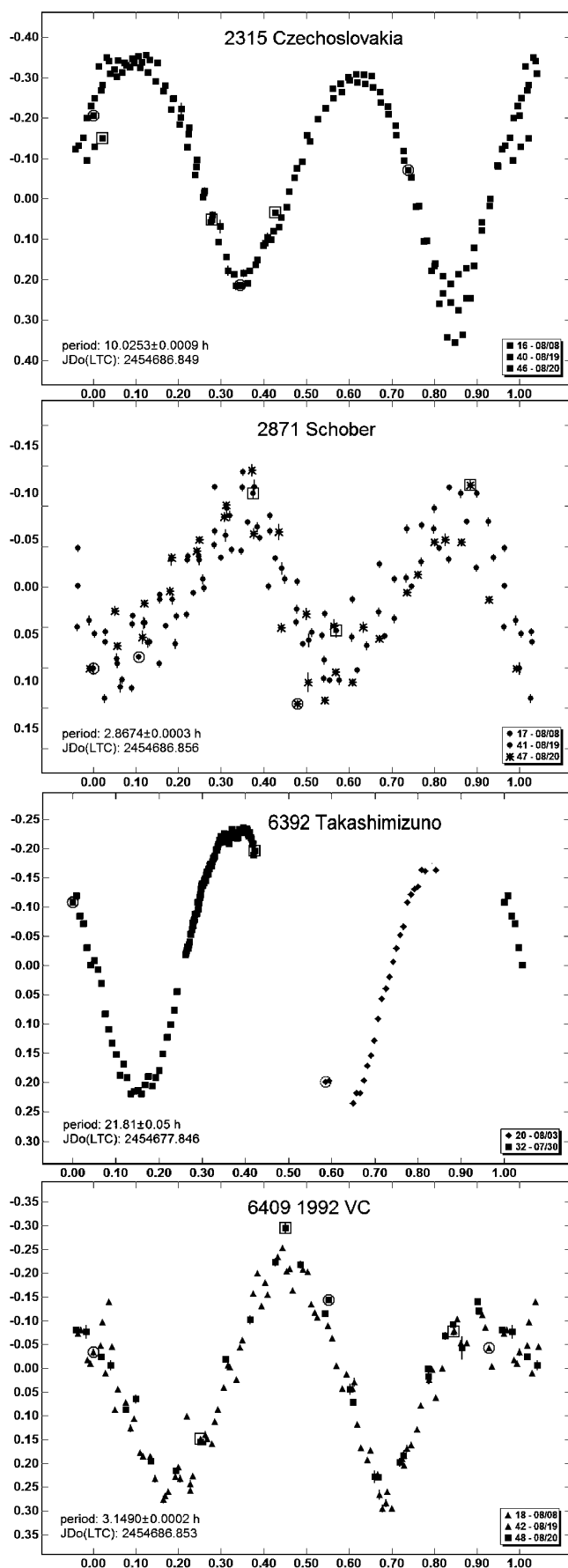




LIGHTCURVE ANALYSIS OF ASTEROIDS FROM LEURA AND KINGSGROVE OBSERVATORIES IN THE FIRST HALF OF 2008

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Photometric observations at the Kingsgrove and Leura Observatories resulted in finding the synodic periods for the following asteroids: 315 Constantia, 5.345 h; 552 Sigelinde, 17.156 h; 1563 Noel, 3.550 h; 1638 Ruanda, 4.2397 h; 1785 Wurm, 3.2696 h; 2066 Palala, 9.732 h; 2193 Jackson, 4.7541 h; 5034 Joeharrington, 8.417 h; 5313 Nunes, 2.798 h; (13189) 1997 AF13, 5.9371 h; and (153591) 2001 SN263, 3.42510 h.

Targets observed from Kingsgrove were selected from the CALL Website maintained by Warner (2008). These targets were chosen mainly for their favourable opposition brightness as well as southerly declination due to restrictions to the observatory's northern horizon. Leura observations were dedicated to photometric binary asteroid survey work with all targets selected for the survey by Pravec (2008). Kingsgrove Observatory used a 0.25-m Schmidt-Cassegrain operating at f/5.2 and ST-402 ME SBIG CCD camera operating at 1x1 binning, resulting in a pixel resolution of 1.40 arc seconds/pixel. Images were 60 s and unfiltered. Leura Observatory used a 0.35m Schmidt-Cassegrain and achromatic 0.5x focal reducer for an effective f/ ratio of 6.5. These were combined with an ST-9XE SBIG CCD camera binned 1x1, resulting in a scale of 1.80 arc seconds/pixel. Images were 300 s and unfiltered. The camera was set to between -35°C and -45°C , depending on local ambient temperature. *MPO Canopus* v.9.4.0.1 software was used for period analysis which incorporates the Fourier algorithm developed by Harris (1989).

315 Constantia. Observations were made while the asteroid shared the field with 2066 Palala. The data showed a bimodal lightcurve with a synodic period of 5.345 ± 0.003 h. This agrees well with the previous result by Behrend *et al.* (2008) of 5.37 h, which was based on data obtained in 2005. The 2005 apparition showed an amplitude of 0.11 mag while, in 2008, the amplitude was 0.60 ± 0.02 mag. This is not unexpected for an asteroid that shows a polar orientation during one apparition and a more equatorial orientation at another.

552 Sigelinde. The previously reported period of 12 h (Behrend 2008), was based on a single short night covering only part of the lightcurve. Analysis of the 2008 data found a period of 17.156 ± 0.002 h.

1638 Ruanda. Behrend (2008) reported a period of 8.4 h for this main-belt asteroid. After six nights of observations with photometric errors of 0.02–0.04 mag, no convincing period was found when assuming a bimodal light curve. Data taken on 2008 May 10 showed an apparent dip in the lightcurve, indicating the possibility of a satellite. Peter Kušnirák was contacted (private communications), who suggested obtaining data with higher precision and additional analysis. Four, higher-quality, data sets were obtained in 2008 June. Once reduced, a trimodal light curve

with a period of 4.2397 ± 0.0002 h and amplitude of 0.10 mag was found. The observed dip was concluded to be spurious and appeared to have been caused by automatic target acquisition inherent to the robotic system used in Kingsgrove. Future low amplitude targets will require dedicated, longer-integration imaging, especially when target is relatively dim.

(153591) 2001SN263. This Amor-type asteroid was observed during its close approach in 2008. Radar observations by Nolan *et al.* (2008) showed that the object is ternary. A campaign by the Photometric Survey of Asynchronous Binary Asteroids (Pravec 2008) was started when the target was two weeks from closest approach. Initial observations by the group detected events that were attributed to the presence of the object's satellites. Kingsgrove contributed 11 sets of high-quality data to the campaign after the asteroid moved to southern skies. Analysis of that data found a rotation period of 3.42510 ± 0.00007 h. No events were detected due to the changing geometry of the object.

Acknowledgement

I would like to thank Peter Kušnirák from Ondřejov Observatory for his assistants with 1638 Ruanda.

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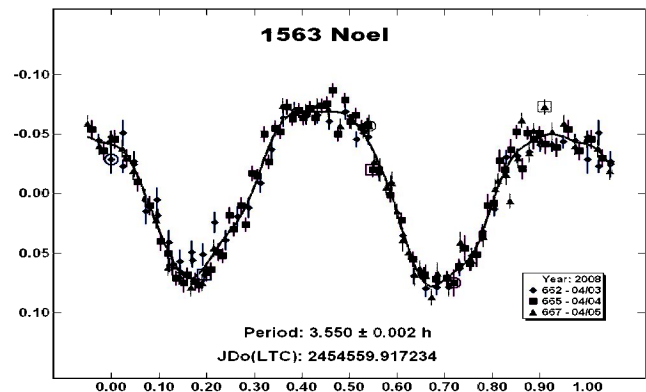
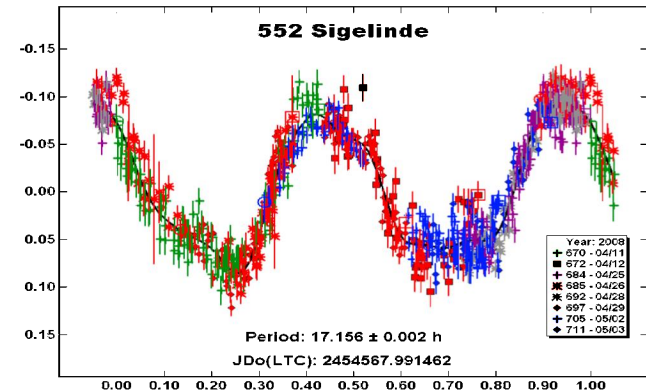
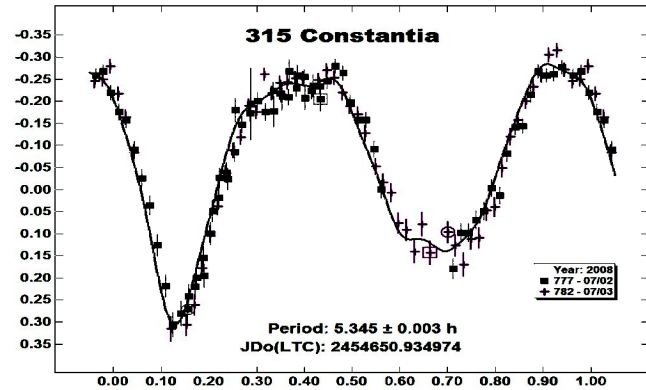
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Asteroid	Date (mm/dd) 2008	Period (h)	Amp mag	Phase (α)	LPAB	BPAB
315 Constantia ⁽¹⁾	07/02-07/03	5.345 ± 0.003	0.57 ± 0.02	19.5	246	3
552 Sigelinde ⁽¹⁾	04/11-05/03	17.156 ± 0.002	0.16 ± 0.02	14.2 - 8.9	240	-5
1563 Noel ⁽²⁾	04/03-04/05	3.550 ± 0.002	0.14 ± 0.02	4.0	198	5
1638 Ruanda ⁽¹⁾	05/11-06/23	4.2397 ± 0.0002	0.10 ± 0.02	11.2-0.2-9.9	253	0
1785 Wurm ⁽²⁾	03/03-03/06	3.2696 ± 0.0004	0.30 ± 0.01	5.0	171	-5
2066 Palala ⁽¹⁾	06/27-07/03	9.732 ± 0.002	0.62 ± 0.02	17.6-19.8	246	3
2193 Jackson ⁽¹⁾	04/12-04/29	4.7541 ± 0.0005	0.24 ± 0.02	9.8 - 3.3	226	-1
5034 Joeharrington ⁽¹⁾	05/02-05/06	8.417 ± 0.004	0.36 ± 0.04	8.0	233	-6
5313 Nunes ⁽¹⁾	06/25-06/26	2.798 ± 0.003	0.28 ± 0.02	18.0	247	4
(13189) 1997 AF13 ⁽²⁾	06/21-06/26	5.9371 ± 0.0006	1.10 ± 0.06	11.7	243	7
(153591) 2001 SN263 ⁽¹⁾	03/13-03/31	3.42510 ± 0.00007	0.10 ± 0.05	26.7 - 24.8	169-185	-16

1 = Kingsgrove Observatory; 2 = Leura Observatory .

