

Number	Name	Dates yyyy mm/dd	Phases deg	LPAB deg	BPAB deg	Period [h]	Amp [mag]
1446	Sillapää	2009 04/15–21	14.6–17.4	182	1	9.659 ± 0.001	0.71
2986	Mrinalini	2007 01/15–16	17.0–17.2	61	1	(15.9 ± 0.1)	0.2
4979	Otawara	2009 04/15–20	14.0–16.5	181	1	2.7037 ± 0.0005	0.26
(12815)	1996 DL2	2008 10/18–19	7.4–7.8	7	–4	(15.8 ± 0.3)	(0.5)
(14901)	1992 SH	2009 06/26–07/11	13.4–18.3	255	16	4.0625 ± 0.0003	0.41
(15914)	1997 UM3	2009 01/09–10	27.7–27.9	57	3	12.8 ± 0.1	0.5
(16717)	1995 UJ8	2006 10/18–22	7.6–8.9	9	9	31.0 ± 0.5	0.6
(24039)	1999 SS8	2009 04/15–19	8.1–9.2	215	12	8.586 ± 0.001	0.73
(27204)	1999 CY74	2009 01/09–10	2.8–3.0	114	–5	9.7 ± 0.2	1.0
44217	Whittle	2009 01/09–10	3.3–3.6	114	–5	9.7 ± 0.1	0.58
(48073)	2001 FC13	2006 10/19–20	1.7–2.2	29	2	34 ± 2	(0.5)
(99812)	2002 LW31	2008 08/28–09/01	4.0–5.4	344	6	150 ± 10	0.8

Table I. Asteroids with observation dates, minimum and maximum solar phase angles, phase angle bisector values, derived synodic rotation periods with uncertainties, and lightcurve amplitudes.

LIGHTCURVES FOR FIVE CLOSE APPROACH ASTEROIDS

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Lightcurves for five near-Earth asteroids observed from Great Shefford Observatory during close approaches between 2009 March and 2009 May are reported: (143651) 2003 QO104, 2009 FH, 2009 HM82, 2009 KW2 and 2009 KL8.

Targets with favourable viewing circumstances were selected based on the ongoing NEO astrometric programme being conducted at Great Shefford Observatory (MPC code J95). A 0.40-m Schmidt-Cassegrain (SCT) operating at $f/6$ and an Apogee Alta U47+ CCD camera were used. The CCD was operated at 2x2 binning, resulting in a resolution of 2.16 arcsec/pixel and the camera was cooled to between -30°C and -40°C , depending on the local ambient temperature. All exposures were taken unfiltered and integrations were limited generally by the fast apparent motion of the objects. *MPO Canopus* version 9.5.0.3 (Warner, 2008), incorporating the Fourier algorithm developed by Harris (Harris et al., 1989) was used for image measurement using differential aperture photometry and lightcurve analysis. The fast motion of 2009 FH, 2009 HM82, 2009 KW2 and 2009 KL8 required frequent telescope repositioning and by necessity, many different sets of comparison stars. Each of the four objects has a relatively short rotation period and in all cases two or more rotations occurred for

each field captured. Small adjustments to the zero points of the comparison star sets used for these four objects have been made to reduce the RMS of the fitted lightcurves to a minimum. All lightcurve plots are “phased” according to the period values given below.

(143651) 2003 QO104. Data were collected on 15 nights from 2009 Apr 22 through May 28. This confirms a similar result by Warner et al. (2009) from observations covering significantly more of the lightcurve obtained between 2009 Mar 17 and Apr 19.

2009 FH. This small NEO was observed for over 2 h during a very close approach to Earth when it reached 15^{th} mag. Due to the fast apparent motion integrations were limited to 2 and 4 s.

2009 HM82. Observed for an hour on 2009 May 2 and for 3 hours on May 3/4, 2009 HM82 was relatively faint at 18^{th} mag and this resulted in a very noisy lightcurve. Integrations were between 8 and 16s.

2009 KW2. Although 15^{th} mag when observed during a close approach on 2009 May 24/25 it was at low altitude (12 deg, rising to 19 deg) and integrations were limited to 2 s due to its fast motion. 35 rotations were completed during the 2 hours of observation.

2009 KL8. Observed on 2009 May 31 when it was at its brightest at 18^{th} mag, two days before closest approach. Another noisy lightcurve resulted from the low S/N measurements.

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#	Name	2009 mm/dd	Data pts	Phase (deg)	PAB _L (deg)	PAB _B (deg)	Per (h)	PE	Amp (mag)	AE
143651	2003 QO104	04/22–05/28	1768	60.7–85.9	184.0	14.9	113.3	0.1	1.4	0.1
	2009 FH	03/17	422	46.7–48.4	153.5	–2.1	0.1073	0.0001	0.33	0.05
	2009 HM82	05/02–05/04	393	25.7–36.1	228.8	16.4	0.1270	0.0001	0.9	0.3
	2009 KW2	05/24–05/25	916	6.1–9.5	247.5	1.1	0.05686	0.00008	0.67	0.15
	2009 KL8	05/31	580	74.2–75.4	249.5	38.3	0.0447	0.0001	0.75	0.25

Table I. Observing circumstances, including observation dates, phase angle range, average phase angle bisector longitude and latitude, derived synodic rotation period with error estimate, lightcurve amplitude with error estimate.

References

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