

**LIGHTCURVES FOR 1318 NERINA,
1342 BRABANTIA, 1981 MIDAS AND 3951 ZICHICHI**

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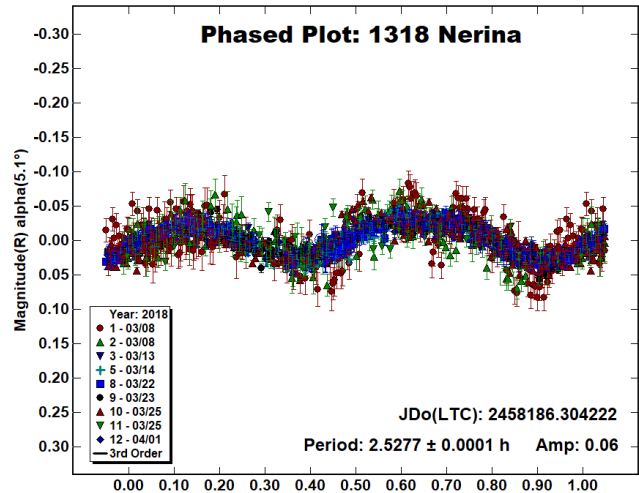
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Photometric observations of three main-belt asteroids were made from Italy in order to acquire lightcurves for shape/spin axis models. For 1318 Nerina the synodic rotation period is 2.5277 ± 0.0001 hours, amplitude 0.06 magnitudes. For 1342 Brabantia the synodic rotation period is 4.1751 ± 0.0001 hours, amplitude 0.18 magnitudes. For 1981 Midas the synodic rotation period is 5.20 ± 0.01 hours, amplitude 0.93 magnitudes. For 3951 Zichichi the synodic rotation period is 3.3953 ± 0.0004 hours, amplitude 0.25 magnitudes.

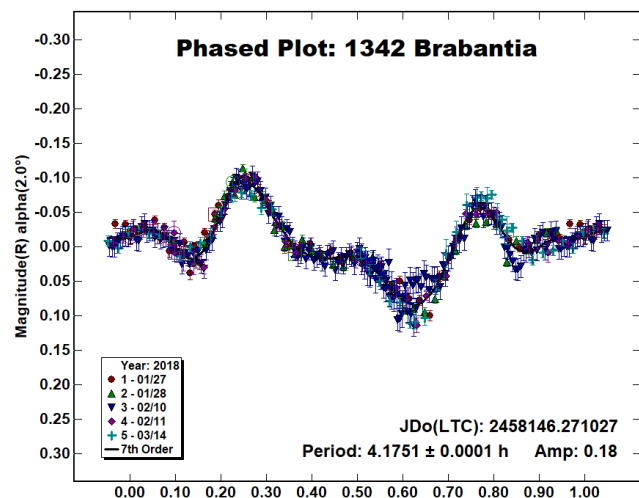
Collaborative observations were made inside the UAI (Italian Amateur Astronomers Union) group in order to observe asteroids selected into the Shape/Spin Modeling Opportunities section from the "Lightcurve Photometry Opportunities: 2018 January-March" (Warner et al., 2018). The CCD observations were made in January-March 2018 using the instrumentation described in the Table I. Lightcurve analysis were made at the Balzaretto Observatory with *MPO Canopus* (BDW Publishing, 2016). All the images were calibrated with dark and flat frames and converted to R magnitudes using solar colored field stars from CMC15 catalogue, distributed with *MPO Canopus*. Table II shows the observing circumstances and results.

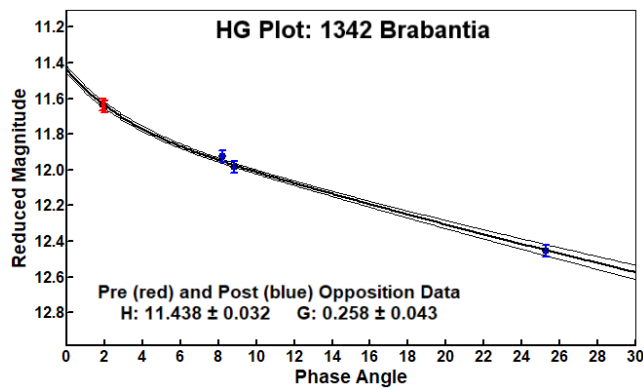
1318 Nerina is a S-type inner main-belt asteroid discovered on 1934 March 24 by Jackson, C. at Johannesburg. Collaborative observations of this asteroid were made over five nights. We derive a synodic period of $P = 2.5277 \pm 0.0001$ h with an

amplitude $A = 0.06 \pm 0.01$ mag, consistent with the previously published results reported into lightcurve database (LCDB; Warner et al., 2009).

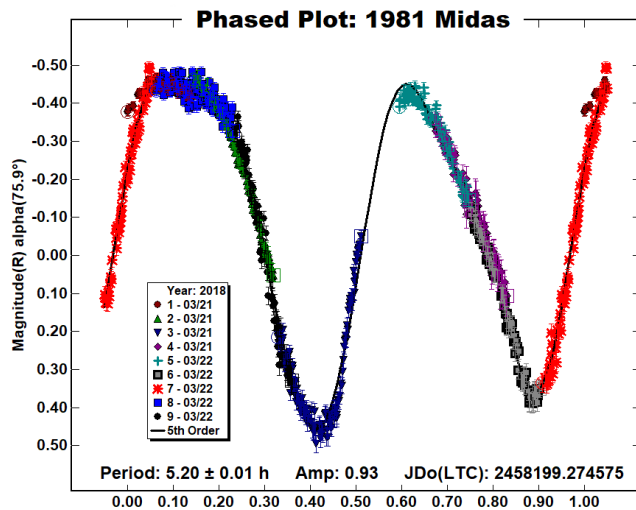


1342 Brabantia is a X-type inner main-belt asteroid, discovered on 1935 February 13 by Van Gent, H. at Johannesburg. Collaborative observations of this asteroid were made over four nights. We derive a synodic period of $P = 4.1751 \pm 0.0001$ h with an amplitude $A = 0.18 \pm 0.02$ mag, consistent with the previously published results reported into lightcurve database (LCDB; Warner et al., 2009). For each lightcurve we measured the half peak-to-peak R mag and deriving the V mag by adding the color index $V-R = 0.41 \pm 0.02$ (Franco and Sergison, 2011). Using the H-G Calculator function of *MPO Canopus*, we derive $H = 11.44 \pm 0.03$ mag and $G = 0.26 \pm 0.04$. This values are close to the previously published results.

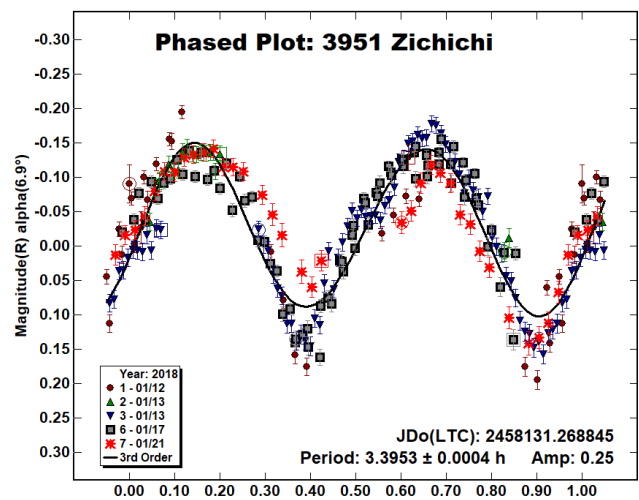




1981 Midas is an V-Type Amor NEA discovered on 1973 March 6 by Kowal, C. at Palomar. Collaborative observations of this asteroid were made over two nights. We derive a synodic period of $P = 5.20 \pm 0.01$ h with an amplitude $A = 0.93 \pm 0.04$ mag, close to the previously published results reported into lightcurve database (LCDB; Warner et al., 2009).



3951 Zichichi is an S-type inner main-belt asteroid discovered on 1986 February 13 by Osservatorio San Vittore at Bologna. Collaborative observations of this asteroid were made over four nights. The lightcurve shows some attenuation events due to the binary nature of this asteroid. We derive a synodic period of $P = 3.3953 \pm 0.0004$ h with an amplitude $A = 0.25 \pm 0.02$ mag, consistent with the previously published results reported into lightcurve database (LCDB; Warner et al., 2009).



Acknowledgements

Some observing sessions and preliminary data analysis of the asteroid 1342 Brabantia were attended by a group of high school students involved in an interesting vocational guidance project about astronomy. From Liceo "A. Avogadro" (Abbadia San Salvatore): P. Bachiorrini, V. Barni, G. Cappelletti, E. Forti, R. Fé, M. Giuliano, G. Lori, G. Magini, M. Marchetti, C. Monaci, Y. Perugini, M. Sbrilli, F. Scussel; from Liceo "G. Galilei" (Siena): N. Aurigi, E. Dringoli, E. Messina, M. Sonno, G. Vagheggini; from Liceo "Sacro Cuore di Gesù" (Siena): A. Ahmed, A. Hu, S. Infante, M. Manetti, A. Muti Pizzetti; from Liceo "E. S. Piccolomini" (Siena): S. Schintu.

References

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Observatory (MPC code)	Telescope	CCD	Filter	Observed Asteroids
Univ. Siena (K54)	0.30-m MCT f/5.6	SBIG STL- 6303e (bin 2x2)	Rc	1342, 3951
M57 (K38)	0.30-m RCT f/5.5	SBIG STT- 1603	C	1318, 3951, 1981
Iota Scor- pii (K78)	0.40-m RCT F/8	SBIG STXL- 6303e (bin 2x2)	Rc	1342, 3951
Eurac (C62)	0.20-m (???) f/? NRT?	QHY9 MAG Z- 9	C	1318
Vegaquattro (K41)	0.30 SCT f/3.4	SBIG ST7XME	C	1318
Tavolaia (A29)	0.40-m NRT f/5	DTA EL- 4710F	C	1318
San Marcel- lo Pistoie- se (104)	0.60-m NRT f/4	Apogee Alta	C	1318
G. Pascoli (K63)	Telescope ?	CCD ?	C	1318
GiaGa (203)	0.28-m SCT f/10	SBIG ST8XME	C	1318

Table I. Observing Instrumentations. MCT: Maksutov-Cassegrain, NRT: Newtonian Reflector, SCT: Schmidt-Cassegrain. RCT: Ritchey-Chretien.

Number	Name	2017 mm/dd	Pts	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E	Amp	A.E.
1318	Nerina	03/08-03/25	1185	5.1,15.6	169	4	2.5277	0.0001	0.06	0.01
1342	Brabantia	01/27-03/14	370	1.9,25.2	130	-2	4.1751	0.0001	0.18	0.02
1981	Midas	03/21-03/22	857	75.9,83.2	137	4	5.20	0.01	0.93	0.04
3951	Zichichi	01/12-01/21	236	6.8,11.8	102	-2	3.3953	0.0004	0.25	0.02

Table II. Observing circumstances and results. Pts is the number of data points. The phase angle values are for the first and last date. L_{PAB} and B_{PAB} are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris *et al.*, 1984).