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SEVEN NEAR-EARTH-ASTEROIDS AT ASTEROIDS OBSERVERS (OBAS) – MPPD: 2017 JAN-MAY

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We report on the photometric analysis result of seven near-Earth asteroids (NEA) by Asteroides Observers (OBAS). This work is part of the Minor Planet Photometric Database effort that was initiated by a group of Spanish amateur astronomers. We have managed to obtain a number of accurate and complete lightcurves as well as some additional incomplete lightcurves to help analysis at future oppositions.

In this paper we publish the results for seven near-Earth asteroids analyzed under the Minor Planet Photometric Database project (*http://www.minorplanet.es*). The data and results were made possible thanks to the collaboration of the Astronomical Center Alto Turia (CAAT) observatory located in Aras de los Olmos and operated by members of the Valencia Astronomy Association (AVA) (*http://www.astroava.org*).

Observatory	Telescope (meters)	CCD
C.A.A.T.	0.45 DK	SBIG STL-11002
Zonalunar	0.20 NW	QHY6
Vallbona	0.25 SCT	SBIG ST7-XME
TRZ	0.20 R-C	QHY8
Elche	0.25 DK	SBIG ST8-XME
Oropesa	0.20 SCT	Atik 16I
Bétera	0.23 SCT	Atik 314L+
Serra Observatory	0.25 NW	Atik 414L+

Table I. List of instruments used for the observations. SCT is Schmidt-Cassegrain. R-C is Ritchey-Chrétien. DK is Dall-Kirkham. NW is Newtonian.

Number	Name	2017/mm/dd	Pts	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E.	Amp	A.E.	Grp
5626	1991 FE	09/03	62	3.3	174	0	2.813	0.061	0.44	0.15	NEA
143404	2003 BD44	03/16-04/11	857	4.6,0.5,47.6	177	3	29.857	0.002	0.55	0.05	NEA
203471	2002 AU4	01/17-01/25	592	27.9,32.3	121	21	12.763	0.004	1.36	0.10	NEA
252091	2000 UP30	05/04-05/05	122	5.8,6.9	188	-1	5.0850	0.167	0.28	0.05	NEA
427643	2003 VF1	05/03-05/08	420	13.2,5.1	226	6	11.528	0.014	0.50	0.10	NEA
	2014 JO25	04/23-04/24	223	24.9,25.0	199	-4	4.540	0.080	0.21	0.05	NEA
	2017 AG5	01/08-01/09	487	12.1,10.9	105	5	7.346	0.047	0.20	0.05	NEA

Table I. 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). Grp is the asteroid family/group (Warner *et al.*, 2009).

Table I shows the equipment at observatories that participated in this work. We concentrated on asteroids with no reported period and those where the reported period was poorly established and needed confirmation. All the targets were selected from the Collaborative Asteroid Lightcurve (CALL) website at (*http://www.minorplanet.info/call.html)* and Minor Planet Center (*http://www.minorplanet.net*)

Images were measured using *MPO Canopus* (Bdw Publishing) with a differential photometry technique.

(5626) 1991 FE. This near-Earth asteroid was discovered on 1991 March 18 by Spacewatch at Steward Observatory, Kitt Peak. The OBAS group made observations on 2016 Sep 9. From our data we derive a rotation period of 2.813 ± 0.06 h and amplitude of 0.44 mag. Krugly (2002a) found a 2.46 h period and Warner (2017a) found 133 h.

(143404) 2003 BD44. This near-Earth asteroid was discovered on 2003 Jan 30 by LONEOS (Lowell Observatory). The OBAS group made observations in 2016 March-April. From our data, we derive a rotation period of 29.857 ± 0.002 h and amplitude of 0.55 mag. This result is consistent with the period of 29.71 h found by Warner (2017c).

(203471) 2002 AU4 is an NEA that was discovered on 2002 Jan 8 by LINEAR at Socorroby. The OBAS group observed the asteroid on three nights in 2017 Jan. From our data, we found a rotation period of 12.763 ± 0.004 h and amplitude of 1.36 mag. Warner (2017a) found a period of 13.26h.

(252091) 2000 UP30. This NEA was discovered on 2000 Oct 30 by LINEAR at Socorro. The OBAS group, especially Elche Observatory (MPC I57, *http://observatorioelche.blogspot.com.es),* made observations on two nights in 2017 April. From our data, we found a rotation period of 5.085 ± 0.17 h and amplitude of 0.28 mag. The period is consistent with the 5.44 h found by Warner (2017a).

(427643) 2003 VF1. This NEA was discovered on 2003 Nov 5 by LINEAR at Socorro. The OBAS group made observations on two nights in 2016 May. From our data, we derive a rotation period of 11.528 ± 0.014 h and amplitude of 0.5 mag. Warner (2017c), based on data obtained in 2017 April, found a period 11.470 h and amplitude of 0.70 mag.

2014 JO25 is an Apollo NEA. It was discovered in 2014 May by A.D. Grauer at Catalina Survey. The OBAS group made observations on two nights in 2017 April. From our data, we derive a rotation period of 4.54 ± 0.08 h and amplitude of 0.21 mag. Warner (2017b) found a period of 4.561 h using data from 2017 April 20 and 21.

2017 AG5 is an Apollo NEA. The OBAS group made observations on two nights in 2017 Jan. From our data, we derive a rotation period of 7.346 ± 0.047 h and amplitude of 0.20 mag. There were no reported periods in the asteroid lightcurve database (Warner et al., 2009).

Acknowledgements

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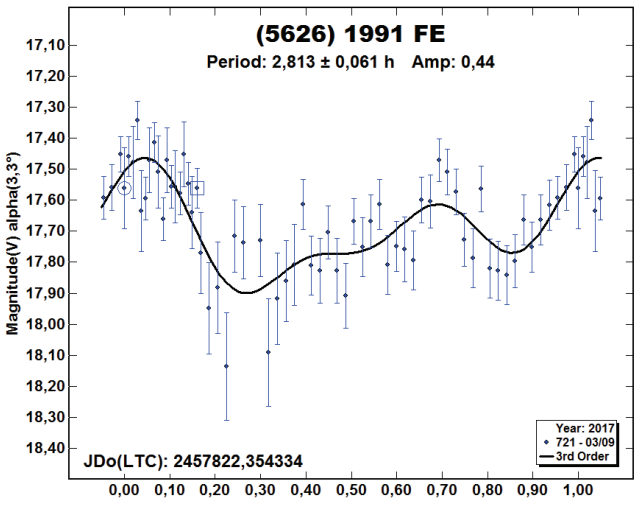
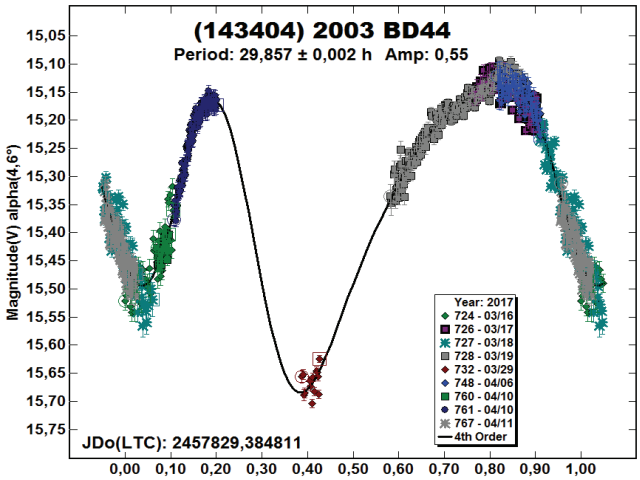
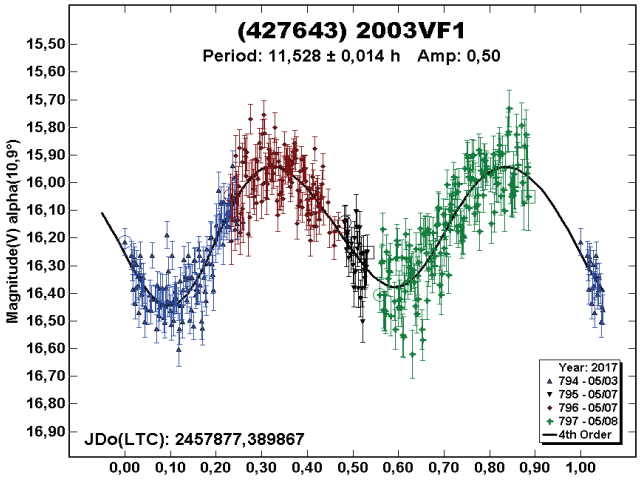



(143404) 2003 BD44
Period: 29,857 ± 0,002 h Amp: 0,55
Magnitude(V) alpha(4,6°)
JDo(LTC): 2457829,384811
Year: 2017
724 - 03/16
726 - 03/17
727 - 03/18
728 - 03/19
732 - 03/29
748 - 04/06
760 - 04/10
761 - 04/10
767 - 04/11
4th Order


(427643) 2003VF1
Period: 11,528 ± 0,014 h Amp: 0,50
Magnitude(V) alpha(10,9°)
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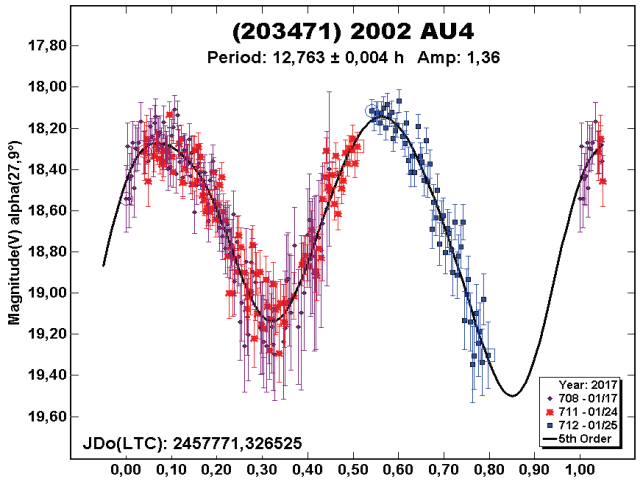
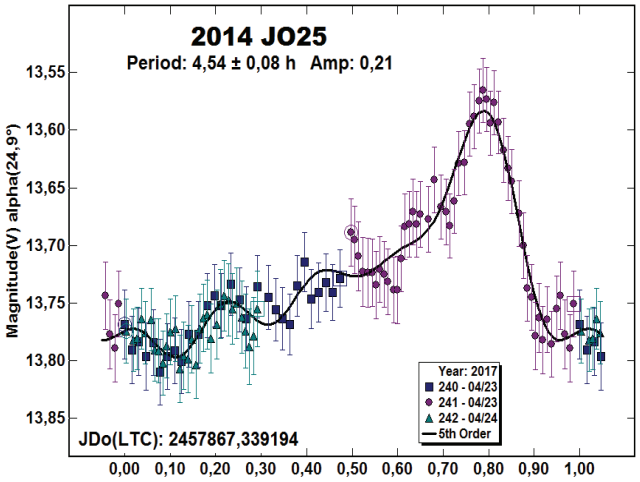
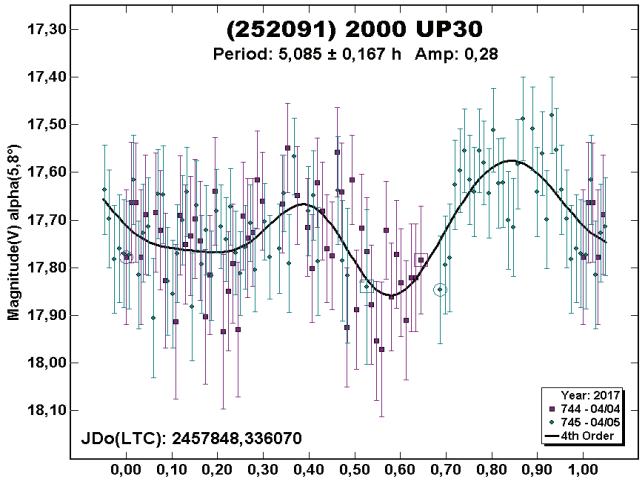
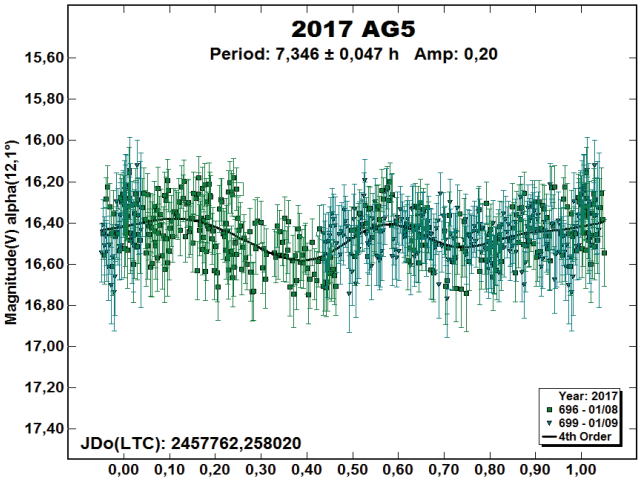
Year: 2017
794 - 05/03
795 - 05/07
796 - 05/07
797 - 05/08
4th Order


(203471) 2002 AU4
Period: 12,763 ± 0,004 h Amp: 1,36
Magnitude(V) alpha(27,9°)
JDo(LTC): 2457771,326525
Year: 2017
708 - 01/17
711 - 01/24
712 - 01/25
5th Order


2014 JO25
Period: 4,54 ± 0,08 h Amp: 0,21
Magnitude(V) alpha(24,9°)
JDo(LTC): 2457867,339194
Year: 2017
240 - 04/23
241 - 04/23
242 - 04/24
5th Order


(252091) 2000 UP30
Period: 5,085 ± 0,167 h Amp: 0,28
Magnitude(V) alpha(5,8°)
JDo(LTC): 2457848,336070
Year: 2017
744 - 04/04
745 - 04/05
4th Order


2017 AG5
Period: 7,346 ± 0,047 h Amp: 0,20
Magnitude(V) alpha(12,1°)
JDo(LTC): 2457762,258020
Year: 2017
696 - 01/08
699 - 01/09
4th Order