ASTEROID PHOTOMETRY AND LIGHTCURVE ANALYSIS OF 1037 DAVIDWEILLA, 1369 OSTANINA, 1718 NAMIBIA, 4221 PICASSO, 4368 PILLMORE, 4901 O'BRIAIN, 6223-DAHL, AND 7353 KAZUYA

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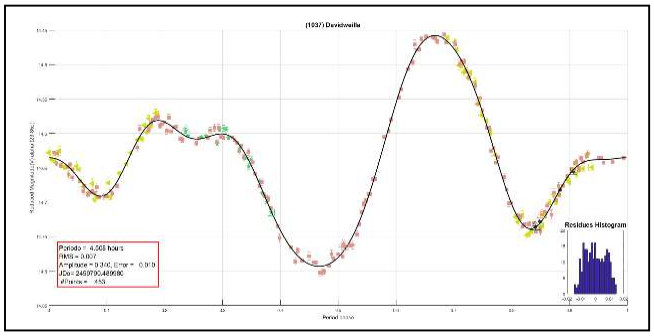
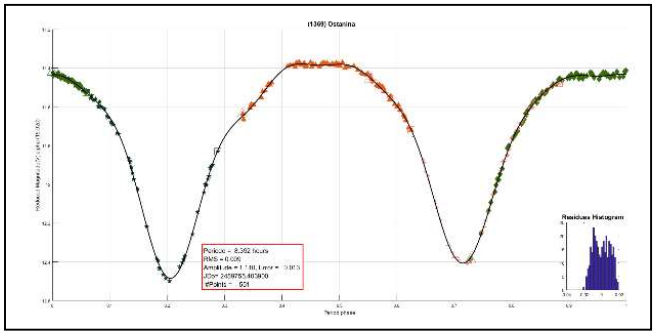
Lightcurves for eight asteroids were measured from 2022 May to August, except for 6223 Dahal, which was observed in 2021 November. Subsequent analysis found periods of: 1037 Davidweilla (4.508 h); 1369 Ostanina (8.392 h); 1718 Namibia (8.594 h); 4221 Picasso (3.111 h); 4368 Pillmore (3.605 h); 4901 O'Briain (2.650 h); 6223 Dahl (3.334 h); and 7353 Kazuya (6.387 h).

All observations reported here were unfiltered. The images were calibrated using bias, dark, and flat frames. Images were measured and periods analysis were done using *FotoDif* (2021) and *Períodos* (2020) packages. All data were light-time corrected. The results are summarized below. Individual lightcurve plots along additional with comments as required are also presented. In some cases, we wanted to update the data of these asteroids, but in others, we did not find any recent photometric data, or models, for them.

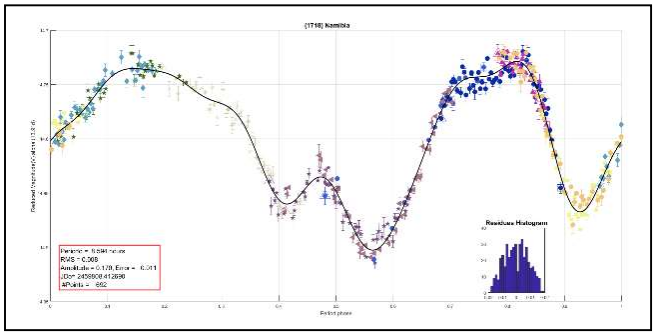
1037 Davidweilla. Discovered by Benjamin Jekhowsky in 1924 October at Argelia, we could find no lightcurve or rotational period previously published. Our data were taken from 2022 July 29 to August 8, with phase angles of 24.1º and 20.5º respectively. We found P = 4.508 ± 0.007 h and A = 0.34 ± 0.01 mag. There were insufficient data to model the asteroid's spin axis.



1369 Ostanina. There is a model of 1369 Ostanina in the DAMIT database (Durech, 2022) that was made in 2019. The last published lightcurve was by Behrend (2016web). We observed Ostatina from 2022 June 24-28. Our results are very similar to previous work: P = 8.392 ± 0.009 h, A = 1.110 ± 0.013.

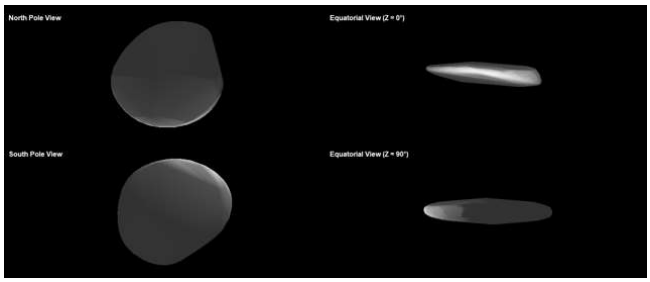


1718 Namibia. We found only one lightcurve reported for 1718 Namibia (Ferrero, 2011; 8.61 h) but no model in DAMIT. We took data between 2022 August 17-25. The phase angle decreased from 13.7º to 9.9º during that time. Our results are in excellent agreement with the Ferrero's: P = 8.594 ± 0.008 h, A = 0.17 ± 0.01 mag. All our data have been uploaded to the ALCDEF database.

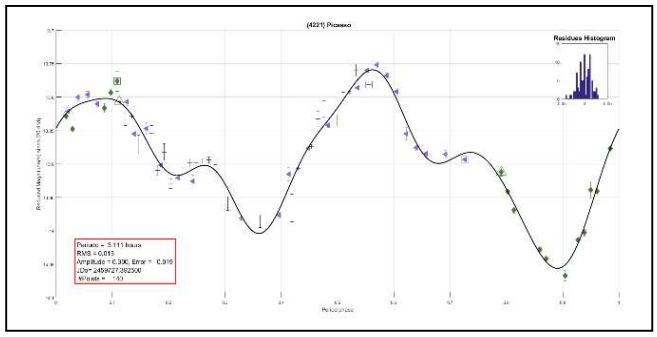


In addition, we obtained a very preliminary model for this asteroid. The only dense lightcurves available in the ALCDEF database are from this work. Regardless, it's possible to estimate a preliminary 3-D model when combining dense data obtained in just one season with sparse dat. As has been shown (Ďurech et al, 2020; Hanuš et al., 2021), models can be found using sparse data alone.

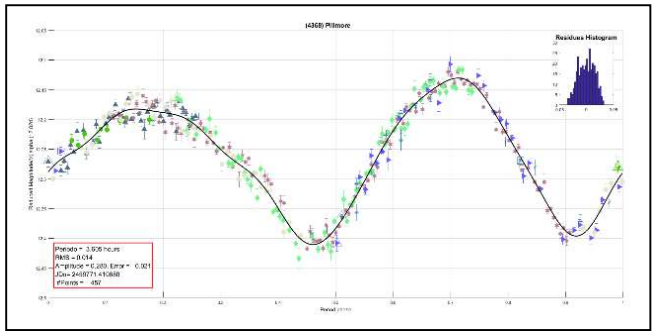
We combined our dense lightcurves with sparse data from ASAS-SN (Shappee et al., 2014), aplying the lightcurve inversion method (Kaasalainen and Torppa, 2001) implemented in the *MPO LCInvert* package (BDW Publishing, 2016). We obtained a preliminary spin axis of λ = 150, β = +53. We emphasize that this is a preliminary result and additional dense lightcurves from different seasons are necessary to obtain a more robust solution.



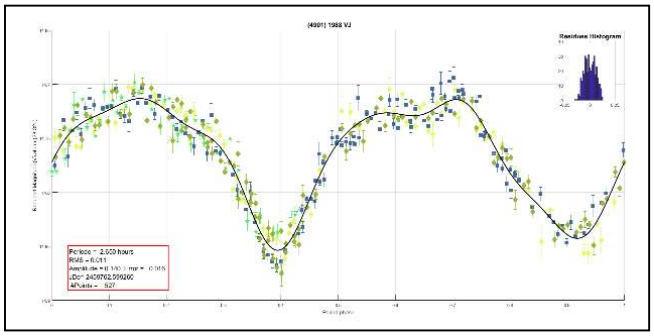
4221 Picasso was discovered by Jeffrey Thomas Alu in 1988 March at the Mount Palomar Observatory. It belongs to the main belt of asteroids. Percy (2018) reported P = 3.11 h and A = 0.31 mag. Our data were taken from 2022 May 27 (phase angle = 20.2º) to June 1 (phase angle = 21.6º). Our results are in good agreement with those from Percy: P = 3.111 ± 0.012 h and A = 0.30 ± 0.02 mag. However, the lightcurve shape is a little bit strange; it seems that there might be two signals in it. There is no model of Picasso in DAMIT.



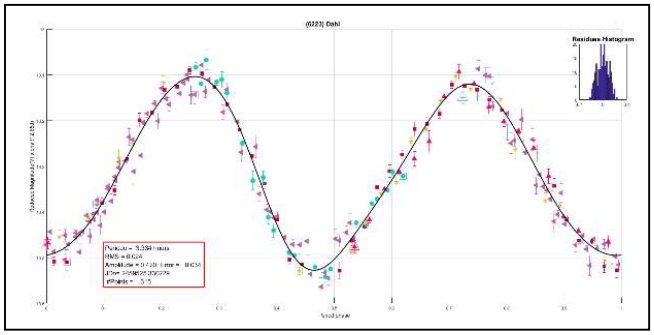
4368-Pillmore. There is a lightcurve of Pillmore reported by Warner (2006). We thought that the rotation period might need a revision, so we observed it between 2022 July 10 (phase = 12.9 º) and July 28 (phase = 10.2 º). Our results were very similar to Warner (2006): P = 3.605 ± 0.014 h and A = 0.28 ± 0.02. We conclude there has not been any significant change in the period over recent years.



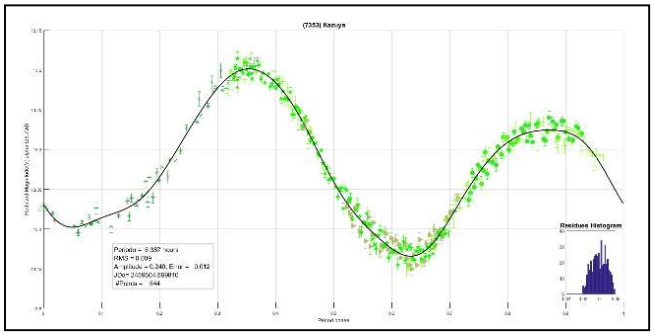
4901 O'Briain (1988 VJ) belongs to the main belt. It was discovered in 1988 November by Masaru Arai and Hiroshi Mori at the Yorii Observatory in Japan. We did not find any photometric data model or published lightcurve for O'Briain. We worked on it from 2022 July 1 (phase angle = 28.5 º) to July 10 (phase angle = 26.2 º). Our results are P = 2.650 ± 0.011 h and A = 0.14 ± 0.02 mag.



6223 Dahl (1980 RD). We found a lightcurve of Dahl reported by Waller (2013). His results are in agreement with ours. We started our observations on 2021 November 6 (phase angle = 12.8 º) and finished on November 10. Our analysis found P = 3.334 ± 0.024 h, A = 0.42 ± 0.03 mag.



7353-Kazuya. It seems, Kazuya is not a very popular asteroid to observe: we found no photometric data, lightcurve, or model for it. Our observations started on 2022 August 12th (phase = 26.8 º) and finished on August 27th (phase = 24.6 º). Our measurement showed us a very clear light curve, and P = 6.387 ± 0.009 h, A = 0.24 ± 0.01 mag. Kazuya was discovered in 1995 January by M. Hirasawa and S. Suzuki at the Monte Nyukasa Observatory, in Japan.



Number	Asteroid	20yy mm/dd	Phase	Period(h)	P.E.	Amp	A.E.
1037	Davidweilla	22/07/29-22/08/08	24.1-20.5	4.508	0.007	0.340	0.010
1369	Ostanina	22/06/24-22/06/28	15.8-16.8	8.392	0.009	1.110	0.013
1718	Namibia	22/08/17-22/08/25	13.7-09.9	8.594	0.008	0.170	0.011
4221	Picasso	22/05/27-22/06/01	20.2-21.6	3.111	0.013	0.300	0.019
4368	Pillmore	22/07/10-22/07/28	12.9-10.2	3.605	0.014	0.280	0.021
4901	O'Briain	22/07/01-22/07/10	28.5-26.2	2.650	0.011	0.140	0.016
6223	Dahl	21/11/06-21/11/11	12.8-14.7	3.334	0.024	0.420	0.034
7353	Kazuya	22/08/12-22/08/27	26.8-24.6	6.387	0.009	0.240	0.012

Table I. Observing circumstances and results. Phase is the solar phase angle given at the start and end of the date range. If preceded by an asterisk, the phase angle reached an extrema during the period.

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