

## Possible new members of Datura asteroid family

A. Rosaev (1), E. Plavalova (2)

(1) NPC “Nedra”, Yaroslavl, Russia (hegem@mail.ru), (2) Astronomical Institute Slovak Academy of Science, Bratislava, Slovakia (plavalova@komplet.sk)

### Abstract

The problem of origin and age of asteroid families is studied very intensively. The youngest families are the most interesting due to the possibility to reconstruct their collisional history. Here we report about three possible new members of Datura family.

### 1. Method and Results

A search for new members of young asteroid families was done. The list of orbital elements of 415000 asteroids with permanent numbers and 200000 non-numbered asteroids was used. The method of selection of the nearest orbits is similar to that used in [1]. In some cases of the most recent events, the reconstruction of the origin of the asteroids in close orbits is possible in models of low-velocity breakup. In our results, three new members of Datura family (338309, 2002 RH291, 2014 OE206), not listed in [2, 3], were detected (table 1). The age of Datura family is estimated to be approximately  $450 \pm 50$  thousands years [2]. It means, that we can use osculating orbital elements for the study of this family.

Table 1: Osculating orbital elements of Datura family members at epoch 16-01-2009

	<i>Object</i>	$\omega$	$\Omega$	$e$	$a$
1270	Datura	258.84072	97.881919	0.207917	2.234316
215619	2003 SQ168	259.39568	97.467904	0.207908	2.234266
60151	1999 UZ6	260.57151	96.799872	0.207812	2.235186
89309	2001 VN36	266.85629	92.976202	0.206341	2.235595
90265	2003 CL5	261.84375	95.697778	0.207471	2.234865
203370	2001 WY35	260.44606	96.872107	0.207435	2.235226
	2003 UD112	263.12446	95.478778	0.206934	2.234566
<b>338309</b>	<b>2002 VR17</b>	260.60046	96.806362	0.207747	2.235169
	<b>2002 RH291</b>	262.04302	95.759280	0.207613	2.235326
	<b>2014 OE206</b>	261.72701	96.265302	0.206975	2.235606

The distribution of Datura family members in coordinates  $(a, e)$  is given in Fig.1 where new members are shown as a dots and the original members as a diamonds.

Numeric integration has shown that two of the new members of Datura family have recent close encounters with original members (table 2).

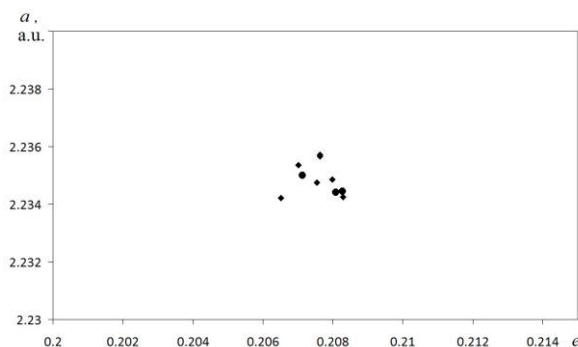


Figure 1: The positions of Datura family members in  $(a, e)$  coordinates

Table 2. Recent close encounters in Datura family

#	<i>Objects</i>	<i>Epoch</i>	<i>Distance, km</i>
1	60151 2002RH	1844 Sept	25500
2	203370 2014OE	1875 Mar	126000

These new members can help to understand the circumstances of the origin of Datura family. For example, an important question to ask is if all the known members of Datura family have a common origin or if they came into existence in a few recent subsequent low-velocity breakups?

### 2. Summary and Conclusions

We have found three new members of Datura asteroid family. These new members can help provide us with a clearer understanding and more accurate estimation of the epoch and circumstances of the origin of Datura family.

### References

- [1] Nesvorný D., Vokrouhlický D. New candidates for recent asteroid breakups. *The Astronomical Journal*, 132, pp.1950-1958, (2006)
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