MONITORING HAZARDOUS OBJECTS

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Abstract.
The high rate of *NEO* discoveries requires a tool for discriminating which objects need particular astrometric observations owing to possible close encounters with our planet. A list of hazardous asteroids is presented and the criteria for selecting these objects is also briefly discussed.

The Sormano Observatory has been involved in follow-up of *NEO*s since many years, during which the demand to monitor such objects was taken into account in order to plan an adequate astrometric campaign. Since the Minimum Orbital Intersection Distance (MOID) between two orbits gives some information about the collision hazard (Bowell, 1995), a software for computing the Earth-MOID value from the first set of orbital elements was developed (Sicoli and Manca, 1996; Matarazzo, 1997), following the algorithm presented by Sitarsky (1968). Due to the time variation of MOID value produced by planetary perturbations (see Fig. 1) and to the the uncertainty of the orbital elements, all the objects with Earth-MOID < 0.06 AU should be taken in serious consideration. A procedure for an automated search of the minimal nominal distance has been then completed (Testa, 1992 and 1997) and the results finally compared with other sources (Yeomans and Chodas, 1994; Chodas, 1998).

A first list of *PHO*s (*Potentially Hazardous Objects*), including minor planets having absolute magnitude $H \leq 22$ and periodic comets, is available since 1998 at the URL `http://www.brera.mi.astro.it/sormano/mbpl.html` under the name of *Minor Body Priority List*. The selection criterion for including objects in this list depends both on the Earth-MOID distance and the Orbital Uncertainty Parameter U adopted by the Minor Planet Center (Marsden, 1995). Computations of the close approaches over a timespan of three centuries are presented only for asteroids with sufficiently good orbital elements ($U \leq 5$); close approaches in the past (-100 y from present) are reported in order to allow searches on old archive plates. More recently, for the most interesting cases also an estimate of the minimum and maximum miss distance is computed, using a software developed by the *OrbFit* consortium (Milani *et al.*, 1999; see Fig. 2).

Last year another similar list, including smaller objects ($H > 22$) has been added at the URL `http://www.brera.mi.astro.it/sormano/sael.html`. Both list are updated weekly.

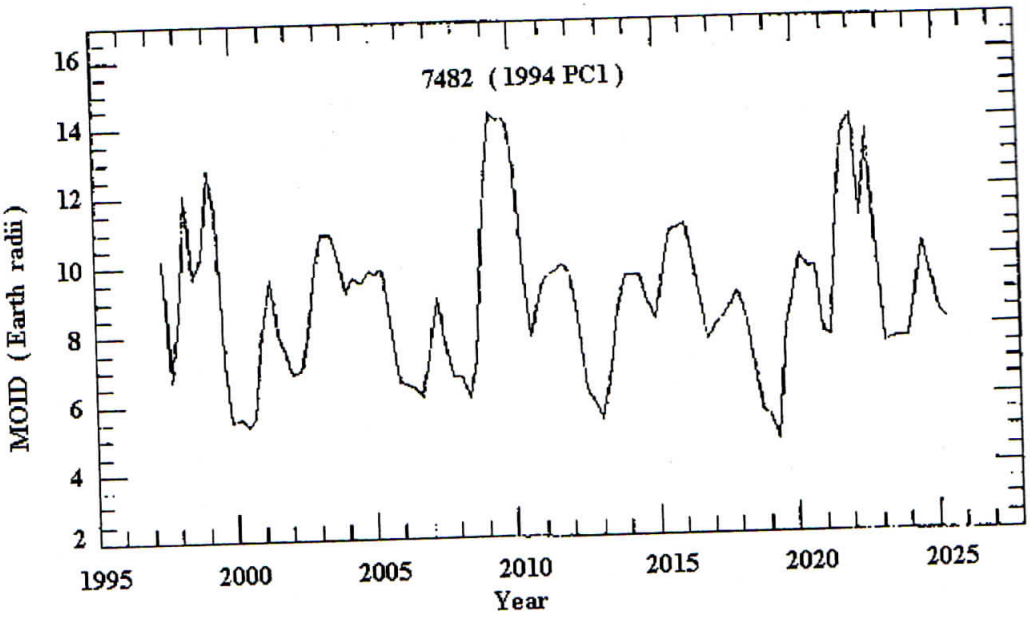

Fig. 1. Time variation of Earth-MOID of asteroid (7482)

Object	Earth MOID	U Parameter	H	Opps	Arc		Predicted close encounters with the Earth Date	Nominal Dist. (AU)
(2340)	0.0071	3	19.2	5			1921-10-20	0.010
							1952-10-22	0.067
							1976-10-20	0.0078
							2007-10-22	0.060
							2014-10-22	0.048
							2045-10-21	0.024
			min	0.00657	max	0.00659	2069-10-21	0.00658
			min	0.00560	max	0.06009	2086-10-22	0.00576
							2113-10-23	0.039
			min	0.004	max	0.071	2130-10-23	0.019
			min	0.003	max	0.045	2194-10-23	0.006

Fig. 2. Example of an entry in the *Minor Body Priority List*

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