The Vesta Asteroid Family: Study of the family and close encounters with terrestrial planets

M. Galiazzo* (1), D. Souami** (2,3) & J. Souchay (3)

(1) Institut für Astronomie der Universität Wien, Türkenschanzstr. 17, A-1180 Vienna, Austria, 
(2) Université Pierre et Marie Curie, 75252 Paris cedex 5, France, 
(3) SYRTE, Observatoire de Paris, CNRS UMR 8630, UPMC, 61 avenue de l’Observatoire, 75014 Paris, France

* mattia.galiazzo@univie.ac.at
** damya.souami@obspm.fr

Key words: Vesta asteroid family, family identification, NEA, close-encounters.

Abstract

The Vesta family is the largest asteroidal family known in the inner asteroid belt. Most of the identified members which belong to this family are V-type asteroids and they are regarded as one source for NEAs. They are also thought to be the source of the HED meteorites (Howardite Eucrite Diogenite), in particular these are supposed to come from the crust of the asteroid (4) Vesta (Cochran et al., 2004). They are mainly perturbed by Jupiter, drifting in three-body and weak secular resonances until they are captured in the strong $z_2$ resonance, $2(g - g_6) + s - s_6$ (Carruba et al., 2007).

We first confirm their membership. Using the AstDys data base of proper elements provided by Milani and Knezevic (2003), and by using an updated HCM algorithm we will redefine the family and compare the results with previous ones. After identifying the Vesta family members we make a long term statistical dynamical study of the members of this family, integrating them over 100 My and reporting all close encounters with the terrestrial planets, even determining dispersion angles and possible collision velocities with them.

References