**STATISTICAL STUDY OF MEAN MOTION RESONANCES AND PHYSICAL PROPERTIES OF HUNGARIA ASTEROIDS USING FAIR.** J. Sztakovics[1,2], E. Forgács-Dajka[2], Zs. Sándor[2], J. Vanyó[1,3], A. Gucsik[1,4], [1]Eszterházy Károly University, Eszterházy tér 1, 3300 Eger, Hungary (sztakovics.jan@uni-eszterhazy.hu), [2]Eötvös University, Department of Astronomy, Pázmány Péter stny 1/A, H-1117 Budapest, Hungary, [3]Konkoly Observatory, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences, H-1121 Budapest, Konkoly Thege Miklós út 15-17., Hungary, [4]University of Debrecen, Department of Geology and Minearology, Egyetem tér 1, 4400 Debrecen, Hungary.

**Abstract:** Mean motion resonances (MMRs) play an important role in shaping the dynamics of the Solar system bodies. MMRs in the Solar system usually occur between a planet and small bodies, e.g. the members of the Hilda group of asteroids are in a 3:2, while the Trojan asteroids are in a 1:1 MMR with Jupiter. Based on the geometrical meaning of the resonance variable, an efficient method has been introduced and described in Forgács-Dajka, Sándor & Érdi [1], by which mean motion resonances can be easily found without any a priori knowledge of them. The efficiency of this method - named FAIR (**FA**st **I**dentification of mean motion **R**esonances) - is clearly demonstrated by using some known members of different families of asteroids being in mean motion resonances with a planet.

The Hungaria group is a family of asteroids in the main asteroid belt orbiting the Sun between the orbit of Mars and that of Jupiter (see e.g. [2] and references therein). In this research we systematically apply the method FAIR to the Hungaria family objects to identify the dynamically relevant MMRs between them and Jupiter or Mars. In Fig. 1 we show that the method FAIR is able to detect capture into a MMR in case of a member of Hungaria group.

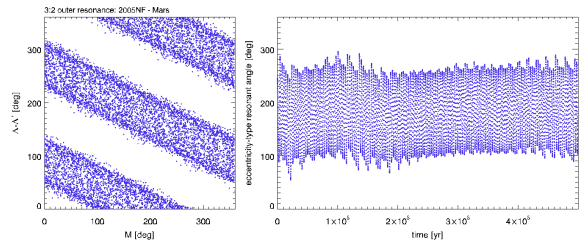


Figure 1. Asteroid $2005_{NF}$ in a 3:2 MMR with Mars.

Our investigation may help to find possible new subfamilies of the Hungaria group based on resonance, and besides, we examine whether there is any correlation between the physical properties and the dynamical parameters of asteroids.

**Acknowledgement:** This research has been supported by the Hungarian National Research, Development and Innovation Office, NKFIH grant K-119993 and the HAS Wigner RCP – GPU-Lab.

**References:** [1] Forgács-Dajka, E. et al. (2018) Monthly Notices of the Royal Astronomical Society, Volume 477, Issue 3, p.3383-3389., [2] Warner, B. D. et al. (2009) Icarus, 204,172-182