

**“GLOBAL” TECTONISM ON ASTEROIDS?** K. Sárneczky<sup>1</sup>, A. Kereszturi<sup>2</sup> (<sup>1</sup>Hungarian Astronomical Association, H-1461 Budapest, Pf. 219, Hungary. E-mail:sky@mcse.hu, <sup>2</sup>Department of Physical Geography, Eötvös Loránd University, H-1117 Budapest, Pázmány sétány 1/C., Hungary. E-mail:krub@freemail.hu)

**Introduction:** Based on the observations of Vikings, Galileo and NEAR spacecrafts, linear structures appeared on the surface of Phobos, Gaspra, Ida and Eros [1,2]. Here we report our first results of the comparison of the three greatest linear structures: the Townsend Dorsum on Ida, the Rahe Dorsum on Eros, and the Kepler Ridge on Phobos.

**Structures:** On Ida the most prominent linear structure is Townsend Dorsum [3,4]. It spreads across near 150 degrees of Ida circumference so its length is about 40 km. Its shape is poorly known because during the closest approach of the flyby it was not on the spacecraft photographed side of Ida. The points of Townsend Dorsum nearly fits to a plain. On the first three pictures (Fig. 1/A,B,C,D) it is visible that one side of the plain of the dorsum - at certain parts - is the asteroid's surface. Because it can be observed around Ida circumference 150 degrees at least, we suppose that it is a continuous structure and have to “slice” up that hemisphere. It is useful to search for signs on other parts of Ida which are align to the plain of the dorsum or other nearly parallel linear structures. There are possible two regions for this. On Fig 1/E there are signs of two linear structure systems, one is nearly parallel with the dorsum (marked with x) [5]. On Fig. 1/F around the end of the Townsend Dorsum there are ridges inside crater Undara (marked with y), but may related to the dorsum just like the Riedel- or P-fractures known from Earth. Their and the upper mentioned structures' location is on Fig. 1/G. The problem with the “y” structures, that only a straight part is visible and it is not possible to determine their real position in space. We can just assume that their could be also fault plains with small angles relative to Townsend Dorsum.

On Eros the most prominent structure is the non

continuous Rahe Dorsum [4]. Its full length is nearly 120 degrees around Eros circumference [6] with positive relief of some 10 m. It is far smaller than Townsend Dorsum on Ida, but both dorsums' plain alignment suggest that they are parts of one structures originated by the same process. On Phobos there are far greater variety of linear structures. The best pair of the upper mentioned structures is the Kepler Ridge [7], but it is not as prominent as the upper mentioned two.

**Discussion:** Because of the similarity in the physical parameters of Ida and Eros there are good reasons for the comparison. These nearly global structures can help 1. in the determination the internal rigidity, 2. in the reaction to the impact strain with the analysis of these global structures. For example, based on the chemical analysis and bulk density, there are voids inside Eros [8,9] and the analysis of one tectonic structure along the surface help in the determination of internal homogeneity. To analyze the smaller linear structures on Eros can help whether the “x” and “y” structures are probably related faults of Townsend Dorsum or not. In the future we would like to analyse the antipodal region of Rahe Dorsum on Eros too, and extend the search with the method discussed in [10].

**References:** [1] Jeffrey F. Bell (2001) *LPSC XXXII*. #1964, [2] Cheng A. F. et al. (2001) *LPSC XXXII*. #2041, [3] Michael J. S. et al. (1992) *Space Sci. Rev.* vol. 60. [4] Thomas P.C. et al. (1996) *Icarus* 120/20-32. [5] Planetary Data System. [6] Yeomans D. K. et al. (2000) *Science* 289/2085-2097. [7] Thomas P.C. (1979) *Icarus* 40/223-243. [8] Britt D. T., Yeomans D., Consolmagno G. J. (2001) *LPSC XXXII*. #1212. [9] Wilkonson S. L. et al. (2001) *LPSC XXXII* #1721. [10] Horváth A. et al. (2001) *Adv. Space Res.* 27. Pp. 1489-1492.

