DATEBASE OF LUNAR-LIKE RILLES ON MERCURY. A. Kereszturi (Department of Physical Geography, Eötvös Loránd University, H-1117 Budapest, Pázmány sétány 1/C., Hungary. E-mail: krub@freemail.hu)

Introduction: In our previuos work we searched fo lunar-like rilles on Mercury [1] and found about 70 possible rilles on the images of the first encounter of the Mariner-10. This abstract is about an increasing datebase on the found rilles on Mercury. The sinuous lunar rilles (rimae) were carved by thermal erosion of lava flows and/or subsequent collapse of lava tubes on the mare basalt terrains of the Moon [2,3]. Because of the several similarity between the evolution of the Moon and Mercury there is reason to analyse rilles on Mercury too [4].

Working method: In the first phase of the datebase making 397 processed images [5] was surveyed with visual method looking for possible rilles. The images were made by the Mariner-10 during its first encounter with 0,2-2 km resolution. The visual searching is somewhat subjective but up to date no better method is known. (In the future we are planning to use some kind of shadow based image processing with different filter orientation to search for possible connection between the tectonic pattern and the orientation of rilles.) In the first step the picture code number was the reference code. After the survey of the images any possible channel was analysed only on the best images among the several ones were made of the same area during the flyby. Because of the slow rotation of Mercury no changes were visible during the flyby on the images of the small rilles. The best images were stretched to mercator projected map of Mercury with Idrisi software. Based on the so borned images we used Surfer software to determine the coordinates of certain surface points and after with simple trigonometric measurement we determined the physical dimensions in km. We determined: 1. Coordinates of the northern/western end point of the rilles, 2. Coordinates of the other end point, 3. Length of the rilles, 4. Average width of the rilles, 6. The best image's reference number. During the measurements the errors arosed from the software, the calculation and the visual plotting accuracy was about several km which is great relative to the dimensions of the channels. Most of the errors originated during the projection transformation, so the location is just to give row information to find the rill. At the physical length, width determination the errors are smaller because the coordinate errors doesn't influence strongly the physical dimension determination. But the length and width values can be used only as a row statistical approach – which is still useful.

We classified one structure as a possible rill if it satisfies the following criterions: 1. Both of the Sun illuminated and shadowed side is visible. 2. Based on the illumination it is a negative relief structure. 3. It does not has exact straight alignment. 4. It does not cut across terrains with highly undulating relief. (One can expect lava flows only to lower terrains and not upstream. Of course it is difficult to estimate the exact surface topography on the images.) 5. It does not align with obvious tectonic structures (estimated by the surrounding tectonic pattern.). 6. The structure does not appear to be connected craters.

General tendencies: There were many problematic cases in the identification, mostly with crater chains [6], and chain like structures, connected depressions wich are frequent; and with possible tectonic originated nearly straight fault-like structures and low relief fold-like structures which are very frequent too. The Caloris-basin has many rill-like structures. They are not included here, and will be part of a different future work. Because the great problems of the identification this datebase can't be considered as a closed work but it is helpful base for the analysis of landforms on Mercury. The datebase will be available free during and after the LPSC XXXIII. on the Worl Wide Web with images of the analysed rilles.

References: [1] Kereszturi A. (2001) Workshop on Mercury #8051. [2] Cameron W. S. (1964). JGR 69/2423-2430 [3] Carr M. H. (1974). Icarus 22/1-23. [4] Martha An Leake The intercrater plains of Mercury and the Moon, Advances in Planetary Geology, NASA TM-84894., 1-537. [5] Planetary Data System, United States Geological Survey. [6] Schevchenko V. V., Skobeleva T. P. (2001) *LPSC32th #1510*.