



## **Normal gravity, neutral surfaces and neutral trees.**

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The presence of the centrifugal term in the formula of the potential of the normal gravity field results in the presence of hyperbolic points on the distant equipotential surfaces. At hyperbolic points the geometry of the normal gravity field can be quite interesting since, under certain conditions, the existence of neutral directions is possible (directions along which the coordinates of the normal gravity vector locally do not change). In this presentation we will show that if such an hyperbolic point is found – we call it special hyperbolic point - then it is not isolated. With the help of the Eötvös matrix, in a more generalized form, it is possible to find at least one special direction on the meridian plane along which a second special hyperbolic point can be found infinitely close to the first. The locus of these points form a special curve on the meridian plane which is the generator of a surface which is called neutral surface.

Finally we state an open problem, i.e. the examination of the existence of two or three special directions at each special hyperbolic point. If multiple special directions at a special hyperbolic point exist will increase the number of the special hyperbolic points along various special directions. This would mean that there exist many neutral surfaces the generators of which will intersect one another on the meridian plane. The image of these section in a small scale will resemble a tree which we call it neutral tree. Due to the symmetry of the ellipsoid of revolution this implies the presence of four neutral trees.