

An empirical determination of electromagnetic attenuation in the Matra Gravitational and Geophysical Laboratory

István Lemperger (1), Viktor Wesztergom (1), Ernő Dávid (2), Geza Huba (2), Péter Lévai (2), Mátyás Vasuth (2), Péter Ván (2), Attila Novák (1), and Árpád Kis (1)

(1) Geodetic and Geophysical Institute, RCAES, HAS, Geomagnetic, Sopron, Hungary (lempi@ggki.hu), (2) MTA Wigner Research Centre for Physics

The Matra Gravitational and Geophysical Laboratory (MGGL) has been established by the MTA Wigner Research Centre for Physics, Institute of Particle and Nuclear Physics in 2015 with the aim of investigation of the attenuation of geophysical noises with depth under the surface.

In cooperation with the Geodetic and Geophysical Institute, RCAES, HAS two temporary magnetic observation station have been set up in the close vicinity of the MGGL, one is in a mine shaft at 140m depth and another at a low electromagnetic noise load site about 200m distance horizontally from the surface projection of the subsurface observation site.

The main goal of the investigation is to provide an estimation of the electromagnetic attenuation in the frequency range of 5-30Hz by means of temporally overlapping two-site observation and direct comparative processing. The natural source of geomagnetic variations in this frequency range is related to global thunderstorm activity. Present study utilizes the fundamental mode of the Earth-ionosphere resonator as the source of large scale EM signal to the estimation of the geomagnetic amplitude attenuation coefficient. The result of the investigation is also confirmed by estimation of the empiric bulk resistivity of the underlying andesite rock.