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Results of the long-term measurements from the Máttra Gravitational and Geophysical Laboratory

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Máttra Gravitational and Geophysical Laboratory was established in Hungary in 2015 with the aim to measure and analyze the advantages of the subterranean installation of third generation of gravitational-wave detectors. The laboratory is located 88 m below the ground. Seismic, infrasonic and electromagnetic noise have been monitored. The seismic data have been collected for almost two years. Methodological improvements for long term data evaluation were developed, too. The structure of the rock above the laboratory was examined with a muon detector, and a novel theoretical framework of noise damping of rock masses was also introduced. Applying our results for the site selection can improve the signal to noise ratio of the multi-messenger astrophysics era at the low frequency regime.

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