Fundamental geodetic and geophysical research at the Metsähovi Geodetic Research Station, Finland

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The importance of geodesy has risen with increasing demand for high precision global reference frames essential for positioning, global Earth monitoring and climate change studies. To pursue this the UN General Assembly agreed in 2015 on a resolution on Global Geodetic Reference Frame for Sustainable Development. The Metsähovi Geodetic Research Station operated by the National Land Survey of Finland in Southern Finland is a part of the Finnish contribution, and provides the basis for the national coordinate, height and gravity systems. The station provides observations for studying diverse geophysical phenomena from Earth's normal modes, variations in Earth's rotation and post-glacial land uplift, to observations required for satellite orbit and geocenter determination.

Metsähovi is one of the few fundamental geodetic observatories of the Global Geodetic Observing System GGOS, housing all the space geodetic observing infrastructure as well as an absolute and relative gravity instruments. First satellite laser ranging (SLR) measurements were made in the late 70's, continuous GNSS, DORIS and gravity measurements were established in the early 90's and the first geodetic VLBI measurements were carried out in 2005. The data is distributed freely to all scientists through the International Association of Geodesy's (IAG) services.

For the last decade the instrumentation of Metsähovi has undergone a major upgrade with two latest generation superconducting gravimeters, an absolute gravimeter and modernized SLR and VLBI systems which will become operational in 2023. In addition, we observe the weather and local hydrology for studying the local environmentally induced effects.

In this presentation I will give an overview of the Metsähovi Geodetic Research Station, its instrumentation and the research carried out at the station and at our department of Geodesy and Geodynamics.

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