



## **Environmental loading effects on GPS time series**

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Loading of the Earth's crust is a multiform phenomenon. In Finland the effect of the ocean tide loading is small and therefore we are able to other loading factors in the time series of a permanent GPS station, Metsähovi. A superconducting gravimeter (SG) is also located in Metsähovi and we can use the synergy of the SG and GPS at the same time to separate the loading from different sources. In the radial component of the GPS time series we have found loading caused by air pressure, non-tidal changes in the Baltic Sea and water storage changes. The range of the vertical motion in Metsähovi is 38 mm. We used regression and loading calculations based on Green's functions to see the effects of different phenomena. The variance of the GPS time series diminishes up to 30 % when all the different factors are taken into account. With shorter time series the reduction is even greater.