



Hydrology Induced Gravity Variation Observed at Vienna and Conrad Observatory

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Mass transport associated with hydrological processes induces gravity variations observed by superconducting gravimeter (SG) and thus can mask essential geodynamical signals. The presented study analyses time series acquired by superconducting gravimeter GWR C025 with a focus on hydrological effects. This gravimeter was transported from Vienna to Conrad Observatory in the end of year 2007. The gravimeter was in both cases installed in an underground laboratory, but Conrad Observatory is located in a mountain area, while Vienna represents an urbanized area. This affords an opportunity to study the hydrological gravity response for two different environments. Several global hydrological models are used to estimate the contribution of global hydrology to gravity variations. Local hydrology is analysed using in-situ meteorological measurements. Significant influence of heavy rain on gravity is observed for both underground stations. The gravity variation observed at Conrad Observatory is additionally strongly affected by snow accumulation and melting phase. The SG installation in an underground laboratory together with a specific topographic situation at the place of observation may lead to an interference of local and global hydrological effect.