



Atmospheric signals in the SG gravity record at Conrad Observatory, Austria

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It is well known, that air pressure variations and precipitation events are clearly imaged in tide free gravity records. Modeling and correcting these effects is a still challenging task for extracting meaningful geodynamical signals from gravity records or for removing noise prior to data analyses in the frequency domain. After a 12 years' record in Vienna the superconducting gravimeter (SG) GWR-C025 has been operating at the Conrad Observatory (Austria) located in mountainous environment. Contrary to Vienna, short-term (period < 5 min) air pressure variations are frequently observed in that area. This permits studying the sign-reversal of the pressure admittance to gravity and the gravity response on high frequency air pressure variations. In many cases, the single admittance concept is sufficient to remove short term air pressure variations and precipitation effects. However, in some cases this procedure fails due to several reasons. For example, the hydrostatical assumption is not justified, especially for convective processes, or mass transport phenomena (redistribution of air, water vapour, water content) are not considered accordingly. In order to investigate atmospheric and precipitation effects on gravity, a wide range of meteorological parameters are monitored by permanent and mobile sensors including micro rain radar and three dimensional sonic anemometer and by utilizing weather radar data in close vicinity of the gravimeter. Selected case studies from the gravity records in Vienna and at Conrad observatory are discussed.