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GNSS Remote Sensing: Overview and recent developments

Ground and satellite based GNSS Remote Sensing (GNSS-RS) developed during the recent two decades into a very powerful and versatile tool for Earth System Research. A highlight of these developments is the operational use of spaceborne GNSS Radio Occultation (RO) data from several satellite missions to improve day-by-day global weather predictions.

GNSS Remote Sensing is briefly introduced with selected applications. One prominent example is the improvement of regional and global weather forecasts. GNSS signals, reflected from water, ice and land surfaces (GNSS-Reflectometry, GNSS-R) can usefully complement the observation capabilities of GNSS-RO mission and enable versatile additional geophysical applications such as observation of wind speed and precipitation over oceans, which are illustrated. Finally, selected aspects for a comprehensive GNSS based Earth Observation with small satellite constellations are presented.