EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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CHALLENGES FOR GNSS-REFLECTOMETRY IN THE ARCTIC

Abstract

Global Navigation Satellite System Reflectometry (GNSS-R) is relatively new technique in remote sensing, using the GNSS reflected signals over the Earth's surface. The Passive Reflectometry and Interferometry System (PARIS) concept was innovated in 1993 by ESA/ESTEC for observing ocean and other surfaces. Today PARIS is being developed for use in various remote sensing applications in Arctic, such as study changes of sea ice level and snow classification (categories of ice age/thickness), the thermohaline circulation of fresh water realized by melting or iceberg calving, roughness of the sea and snow or ice, ocean wind speed etc. In general, the reflected signal is regarded as an error source caused by weakness in the positioning accuracy, but in fact these multipath scattered signals are very useful for remote sensing application. In this process, the transmitter is the GNSS-R L-band satellite signal and the receiver is GNSS-R receiver antenna based on the ground, aircraft or LEO orbit satellite. The GNSS constellation provides a rich source of L-band signals covering the whole globe. Unfortunately, the ionospheric effects in Arctic region increase electron precipitation on satellite signals. This paper focuses on the current status of GNSS-R in the Arctic, its challenges for GPS, GLONASS and future GALILEO signals and future research in this technique.