RESOURCE: an International Initiative for Radio Sciences Research on Antarctic Atmosphere

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RESOURCE (Radio Sciences Research on Antarctic/AtmosphEre) is a new proposed Scientific Research Program (SRP) regrouping Physical and Geoscience Science Groups from SCAR (Scientific Committee on Antarctic Research). RESOURCE aims to establish and reinforce the link between the communities that investigate the polar atmosphere in the Northern and Southern Hemispheres with the users on the field such as, e.g., glaciologist, astrophysicist or polar base managers.

Ionized atmosphere

Neutral components

Support to geophysical studies

Climatology

Ionospheric activity impact on GNSS single frequency positioning for new different locations close to Antarctica grounding line. Ionospheric un-modelled electron content is the main obstacle to extend single-frequency GPS positioning from 1-10km to 1-100m baselines.

Long-term variations of ionospheric parameters at Ukrainian Antarctic station Akademik Vernadsky for the period 1996-2016

Long-term TEC observations

Long-term F2 electron density observations

Log-log histograms of n(TEC) for vH TEC (green) and n(N) (blue). The colored lines are the daily TEC (grey line is noisy for medium solar activity and (Kp50-80). The spread of the colors stands for low and high solar activity (Kp50-80-100 and 100-120, respectively).

Monthly ionosonde observations at Vernadsky station

Total Electron Content

Long-term trends in ionospheric parameters

Total Electron Content

Precipitable water vapor

Neutral components

Ionospheric activity impact on GNSS single frequency positioning for new different locations close to Antarctica grounding line. Ionospheric un-modelled electron content is the main obstacle to extend single-frequency GPS positioning from 1-10km to 1-100m baselines.

Examples of ionospheric phase screen in 2-D and SARM data observed by the ALTGS-PACFM system in the Arctic (red, blue). Ionospheric propagation effects cause significant distortions in the data of low-frequency synthetic aperture radar (SAR) systems, whose severity is increasing with decreasing system frequency. The magnitude and pattern of ionospheric phase screens depend on the strength of the synoptic electric field and on the type of ionospheric instability during the time of image acquisition.

Join us!

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