

Investigation of GPS phase scintillations at Troll station during geomagnetic disturbances in 2018

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Ionospheric phenomena as a response to geomagnetic activity can be different at both hemispheres, in particular at high latitudes, due to the structure of the ionosphere, orientation of the interplanetary magnetic field and structure of the Earth magnetic field. This may have implications on large scale modeling and space weather forecasting. To understand these aspects, a significant number of studies which include both hemispheres are required.

In order to study the asymmetry between the northern and southern hemispheres at high latitudes, we employ the GNSS TEC and scintillation monitors. We use data from a GNSS receiver at Troll station in Antarctica together with corresponding datasets from the northern hemisphere. We carry out detailed study of several representative events for different geomagnetic conditions. We characterize the GPS phase scintillations in the context of interhemispheric asymmetries, and also using other supportive ground based and satellite observations. This is the first study with data from the recently established ionospheric observatory at Troll station in Antarctica. It also forms a ground for more statistical study of interhemispheric asymmetries, where the first results are also shown.