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BIPOLAR CLIMATOLOGY OF GNSS IONOSPHERIC SCINTILLATION UNDER QUIET GEOMAGNETIC CONDITIONS.

L. Spogli*, L. Alfonsi*, G. De Franceschi*, V. Romano* †, M. H. O. Aquino†, A. Dodson† and C. N. Mitchell°

*Istituto Nazionale di Geofisica e Vulcanologia (INGV)
Italy

†Institute of Engineering Surveying and Space Geodesy (IESSG)
University of Nottingham
United Kingdom

°Department of Electronic and Electrical Engineering
University of Bath
United Kingdom

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Abstract.

We analyze data of GNSS ionospheric scintillation over polar regions of both hemispheres, to characterize the scintillation phenomena under quiet conditions of the nearEarth environment through the developement of a scintillation climatology of the high and mid latitude ionosphere. Maps of scintillation occurrence as a function of the magnetic local time and of the altitude adjusted corrected magnetic latitude are then analysed, together with the Total Electron Content (TEC) information, to put in evidence the strong link between the electron density gradients and the ionospheric irregularities causing scintillation. The results shown herein are obtained by merging observations from a network of GISTMs (GPS Ionospheric Scintillation and TEC Monitor) located over a wide range of latitudes in the Northern hemisphere and in Antarctica. Data samples refers to a period of very quiet conditions of the geospace in the last solar cycle. Findings confirm the association of the occurrence of the ionospheric irregularities with respect to the electron density gradients in correspondence of the boundaries of the auroral oval and of the ionospheric trough walls and show the contribution of the polar cap patches even under solar minimum conditions. This work aims to contribute to the development of nowcasting and forecasting tools for GNSS ionospheric scintillation prediction.