



## **Climate and weather of the ionospheric irregularities over Svalbard from solar cycle 23**

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The paper presents an unprecedented description of the climatology of ionospheric irregularities scintillations over the Arctic derived from the longest Global Navigation Satellite Systems data series ever collected for this specific aim. Two TEC and scintillation receivers are working at Ny Ålesund (Svalbard, NO), the first of which has been installed in late September 2003. They sample the L1 and L2 signals at 50 Hz from all the GPS satellites in view. The receivers monitor an area of about 600 km radius that includes the auroral and the cap regions in the European longitudinal sector. The exceptional length of the data series and the privilege site of observation allows describing the Arctic ionosphere along about two solar cycles, from the descending phase of cycle 23 to almost the end of cycle 24.

During this long period, some major scintillation events registered at Svalbard have been selected to characterize the space weather effects on the propagation of GNSS signals into the ionosphere.

Our analysis results into a detailed assessment of the long-term behaviour of the ionosphere under solar maximum and solar minimum conditions, including several periods of perturbed ionospheric weather caused by unfavourable helio-geophysical conditions.

The description obtained after the analysis has been translated into a tool capable to provide a regional forecasting of the scintillation indices 24 hours in advance.