

GPS OBSERVATIONS OF MESOSCALE IONOSPHERE ANOMALIES; EVIDENCE FOR FORCING FROM BELOW?

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A dense net of ten geodetic GPS reference stations in Austria, known with an extremely high precision, allows observations over Central Europe for small and medium scale ionospheric anomalies from station “position errors” derived from carrier phase differences (L1-L2; using the Difference Doppler Effect). From the large number of individual observations over the past decade (2000 – 2009), ionospheric anomalies at F-region level are presented in form of coloured bi-hourly pixel maps (pixel: 0.5 degrees in latitude and longitude).

On about 20% of the days, short lived regional anomalies (50.000 km²) not associated with “space weather” are found, with a preference of occurrence during the winter months. There is a suggestion that these anomalies are associated with orographic effects (Alps), or unstable wind shears (Jet Stream), or at least due to forcing from below via atmospheric gravity waves. The occurrences of these ionospheric anomalies seem to depend not only on the sources but also on the “atmospheric transparency” for the gravity waves.

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