



Observations of TID during the February 2016 ISR World Day campaign

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Gravity waves in the thermosphere interact with the ionosphere causing Traveling Ionospheric Disturbances (TIDs); periodic structures observed in ionospheric parameters such as the plasma density and temperatures. There are two broad sources for these TIDs: waves are generated in-situ by processes such as Joule Heating or they propagate upwards from the lower and middle atmosphere. If the latter source dominates this provides a mechanism for gravity waves generated by meteorological forcing to play a role in the variability of the upper atmosphere in the polar regions. For five days in February 2016 the global array of incoherent scatter radars operated in conjunction as part of a World Day campaign to study gravity waves in the upper atmosphere and ionosphere. Due to the combination of local orography and weather northern Norway is a hotspot for gravity wave generation in the winter months. It also lies within the auroral zone, where geomagnetic activity plays a key role in the ionospheric variability. Data from the EISCAT radars in Norway indicate the presence of gravity waves in the thermosphere during the campaign; TID with periods of 1-2 hours were observed as well as longer period tidal features. These occurred on a variable ionospheric background driven by geomagnetic activity, including bursts of strong ionospheric heating. We will present an analysis of the waves observed by the radars and surrounding instrumentation and an assessment of their contribution to the ionospheric variability during this experimental campaign.