



Ionospheric effects of the missile destruction on December 9, 2009

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We report on ionosonde and meteor radar observations made in Sodankyla Geophysical Observatory (SGO, 67N, 27E, Finland) on December 9, 2009 during a test launch of the Russian solid propellant military missile. Because of the technical problem the missile was self-destroyed around 07 UT at ionospheric height (170-260 km) over the Kola Peninsula (Russia), at a distance about 500 km to east from the observatory. Products of the explosion, including long-lived ionized aluminum oxides, were spread into the large area and reached the region of SGO meteor radar observations in about 2 hours (around 09 UT). After about 3 hours (around 10 UT) a sporadic E layer presumably composed of the remains was observed close to the zenith of the SGO ionosonde. We present the data and discuss possible mechanisms accounting for both vertical and horizontal transport of the remains. Theoretical estimations suggest that the observed transport could be likely due to thermospheric turbulence.