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Winter effects of a night meteor explosion in high latitudes

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On December 19, 2014, the all-sky cameras of the Verkhnetulomsky observatory and the city of Apatity recorded a trace of a meteor fall, the destruction of which over the Verkhnetulomsky reservoir (68.25 N, 31.1 E) at 19:03:07 UT was accompanied by a bright flash. The response of the lower ionosphere was assessed from the behavior of the amplitudes of partially reflected ordinary and extraordinary waves obtained at the partial reflection facility of the radiophysical observatory "Tumanny" (69.0 N, 35.7 E). Variations in the total electron content of the ionosphere from satellite signals of global navigation satellite systems received by a receiver in Murmansk (68.97 N, 33.09 E) are considered. The response of the geomagnetic field to the meteor explosion was examined using data from the magnetic variation station of the Loparskaya observatory (68.25 N, 33.08 E). Analysis of the data obtained shows that the explosion caused sudden changes in environmental parameters. The most likely mechanism for these changes is the passage in the atmosphere of shock, acoustic-gravity and slow magnetohydrodynamic waves generated by the meteor explosion.