

# **Advanced meteor wind observations using meteor and MST radars**

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A few topics from recent developments of radio meteor observation techniques are presented.

The Nippon/Norway Tromsø Meteor Radar (NTMR) has been in continuous operation since November 2003 in Tromsø (69N). One of the major advantages of the present meteor radar is its high echo rate (6000-20000 echoes a day) despite the relatively small transmitting power (7.5kW peak). From ambipolar diffusion coefficients we have successfully extracted atmospheric temperature fluctuations due to gravity waves assuming the Boussinesq approximation. The time and height resolutions of horizontal winds and temperature fluctuations at the altitude of 90 km are 1 hour and 2km, high enough for the study of gravity waves with a period longer than a few hours. Horizontal propagation characteristics of gravity waves are further studied using a theoretical phase relation between the wind and temperature fluctuations.

MST radars in the VHF band have a great potential in meteor echo observations due to their high transmitting power. The meteor measurement can be conducted throughout a day and complement the turbulent echo measurement in the mesosphere, which is limited to daylight hours only. The MU radar of Kyoto University is one of those radars and has been successfully applied to meteor studies by utilizing its very high versatility. The MU radar was recently renewed. Its signal processing unit is up-graded from a 4 analog receiver system to a 25 digital receiver system. In the present study we try to improve the MU radar meteor measurement technique by fully utilizing the new functionality. It is further planned to apply the technique to the Antarctic Syowa MST/IS radar, which is currently under feasibility study.