

R005-36

B会場：11/5 PM2 (15:45-18:15)

16:30~16:45

## 昭和基地 MF レーダーの流星エコー観測に基づく南極下部熱圏領域の大気重力波解析

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### Gravity wave analyses in the Antarctic lower thermosphere based on MF radar meteor observations at Syowa (69S)

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MF (Middle Frequency) radars have long been used to measure wind velocity in mesosphere and lower thermosphere based on correlation analysis techniques [e.g., Reid, 2015]. The motion of atmosphere weakly ionized by solar insolation is measured in the technique. The ionized atmosphere is usually horizontally stratified, and radar echoes from such layered atmosphere are mostly obtained in the vertical direction. However, there also exist echoes coming back from large off-vertical angles. Meteor echoes are such type of echoes often detected at night (winter time in the polar region) mostly above 80 km. Because of the low radio frequency (2-3 MHz) the duration of MF radar meteor echoes is two orders longer than that of VHF meteor echoes. Thus, meteor echoes often dominate the MF radar echoes when the background atmospheric ionization is relatively low, and meteor winds can be estimated up to nearly 120 km altitude [Tsutsumi et al., 1999; 2001]. These meteor echoes have been used to compensate the known problem of MF radar correlation technique above about 90 km, and been applied to tidal wave and mean wind analyses at Syowa station (69S, 39E), Antarctic, since 1999 [Tsutsumi and Aso, 2005]. However, the time resolution of estimated winds has not necessarily been high enough for gravity wave studies, unfortunately.

We have recently redeveloped the MF radar meteor measurement technique and found that MF meteor winds are able to be estimated with time resolution of 1 hr or even much better resolution of 10 min under preferable ionosphere conditions. Combined with the conventional correlation analysis technique, we can now study gravity waves in a wide height range of 60-110 km. Seasonal and height variations of gravity wave energy are to be presented based on 20 years of reanalyzed meteor and correlation winds.

#### References

Tsutsumi, M., D. Holdsworth, T. Nakamura, and I. Reid (1999), Meteor observations with an MF radar, *Earth Planets Space*, 51, 691 – 699.

Tsutsumi, M., T. Aso, and M. Ejiri (2001), Initial results of Syowa MF radar observations in Antarctica, *Adv. Polar Upper Atmos. Res.*, 15, 103 – 116.

Tsutsumi, M. and T. Aso (2005), MF radar observations of meteors and meteor-derived winds at Syowa (69\_S, 39\_E), Antarctica: A comparison with simultaneous spaced antenna winds, *J. Geophys. Res.*, 110, doi:10.1029/2005JD005849