Development of the mesosphere wind observation using meteors on the PANSY radar

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The Program of the Antarctic Syowa MST/IS radar (PANSY) is a large atmospheric radar operating at the Syowa station. The full-system observation of the PANSY radar started in late 2015. While the Polar Mesosphere Summer Echoes (PMSEs) and the Polar Mesosphere Winter Echoes (PMWEs) are major sources for the wind estimation in the mesosphere region, they are highly seasonal and observed only in the daytime. Compared to these PMSEs and PMWEs, meteor echoes are frequently observed throughout the year with less dependency on the time of day. Hence, meteor echoes can be an additional source for the continuous estimation of the mesosphere wind velocities.

Based on that, we have recently been developing the meteor radar functionality of the PANSY radar. Five additional antennas are installed to estimate the direction of arrival (DOA) of meteors as well as the radial Doppler velocities, and dedicated analysis software for horizontal-wind estimation have been developed. Meanwhile, the controlling computer has been replaced to improve data processing performance. Experiment parameters are also optimized to avoid hitting the limit of the hardware capability.

In this presentation, we report the current status of developing the meteor radar functionality of the PANSY radar.