Mid-latitude mesospheric winter echoes and their unusual behavior in the winter season 2016/2017

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Beside the well-known (polar) mesospheric summer echoes in summer seasons there is another phenomenon in the mesosphere which is observable by VHF radars. These so-called (polar) mesospheric winter echoes occur mainly outside the summer months in lower altitudes than the summer echoes, more unequally distributed, and with lower power. The echoes may be linked to enhanced ionization and turbulence, but their cause has not yet been clarified undoubtedly.

Also in mid-latitudes these echoes are observable, but they occur much more seldom than in polar latitudes. However, in the winter season 2016/2017 we observed an unexpected high number of winter echoes and some unusually strong events.

In this presentation we show statistics about the occurrence of mid-latitude winter echoes, their variations, and altitude distribution. Additionally, further parameters like wind velocities, spectral widths, and mean angles of arrival are presented and investigated during the strong events.