

# **PMSE spectra from simultaneous observation using the EISCAT VHF and UHF radars**

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Simultaneous observations of PMSE using the EISCAT VHF (224 MHz) and UHF (933 MHz) radars were made during summer 2005. Experiments with a time resolution of 0.2 s specially designed for PMSE measurements (arc\_dlayer\_ht ) were run and ACFs with 127 lags with 1.562 ms resolution were computed. During the short interval from 12:20 UT until 12:26 UT strong echoes at about 84 km were detected with both radars. That was the first PMSE/EISCAT experiment where data was obtained from both radars with high enough quality to allow accurate spectral analysis.

We calculate spectra from the ACFs and compare them. It appears that for altitudes where PMSE were detected the spectra are quite similar in terms of Doppler shift and spectral width while the backscattered powers are very different. In order to draw a conclusion on nature of these echoes we compare experimental reflectivities and spectral widths for both radars with values based on theoretical consideration of turbulent echoes (e.g. Hocking, 1985).

We model also incoherent backscatter for both radars taking into account the presence of charged aerosols at summer mesopause and compare it with experimental data. Parameters of aerosols such as charge sign and number density which are in the best agreement to experimental spectra are discussed. On the base of all analyses and comparisons the most probable character/cause of these echoes is discussed.