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Comparison of Odin and MIPAS ozone data in the Stratosphere during the Autumn of 2003

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A comparison was made between data sets acquired from the Sub-Millimetre Radiometer instrument (SMR) on board Odin and the Michelson Interferometer for Passive Atmospheric Soundings (MIPAS) on the ENVISAT satellite. The investigation was done between July and November 2003, using MIPAS level 2 data (version V4.61) and the Odin level2 product (from Level1b version 1.4, calibration level 5.4) using the line at 501.8 GHZ. We present various methods for comparison of ozone data obtained from both instruments including an Individual Profile Comparisons technique, zonalmean differences and comparison using measurements of balloon sonde data from the ENVISAT validation database at the Norsk Institutt for Luftforskning (NILU)

Results of these comparisons show generally good agreement between +/- 10%, however, discrepancies were observed during the five months at various altitude ranges. Some larger differences are seen at lower Stratospheric altitudes (19-30 km) where Odin values were consistently larger. Middle to upper Stratospheric altitudes were predominantly dominated by MIPAS values, which could be either due to Odin underestimation or MIPAS overestimation. Comparison to raw balloon data also showed promising results, especially in the Northern Hemisphere where relative difference values were within +/- 10 % of the sonde data for both Odin and MIPAS.

Another method adopted was to utilise the DIAMOND (Dynamical Isentropic Atmospheric Model for Odin Data) assimilation model to help further analyse the relationship between Odin and MIPAS data.