

Stratospheric Water Vapour Profiles over Seoul, S-Korea



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SWARA, the **S**tratospheric **W**ater vapour **R**adiometer, is a ground-based radiometer providing water vapour profiles in the altitude range 25-65 km. The instrument is located in Seoul, S-Korea [latitude 37,32° N, longitude 126,27° E] and has been providing data since November 2006.

SWARA measures the 22.235 GHz rotational transition of H₂O. By spectral decomposition of this emission line we can retrieve water vapour profiles in the stratosphere and mesosphere.

Initial problems with the SWARA antenna led to artefacts in the spectrum and eventually to a reduced altitude coverage of the water vapour profiles.

This problem was overcome in November 2007, giving us now full altitude coverage. A first data set of water vapour profiles is shown in Figure 2 for the timeframe November 2006 to April 2008.

Consistent, long-term measurements, as provided by SWARA, are ideal for short time-scale variability studies, monitoring long-term trends and validation of satellites.



Figure 1: SWARA, as located on the roof of the Sookmyung Women's University in Seoul, S-Korea.

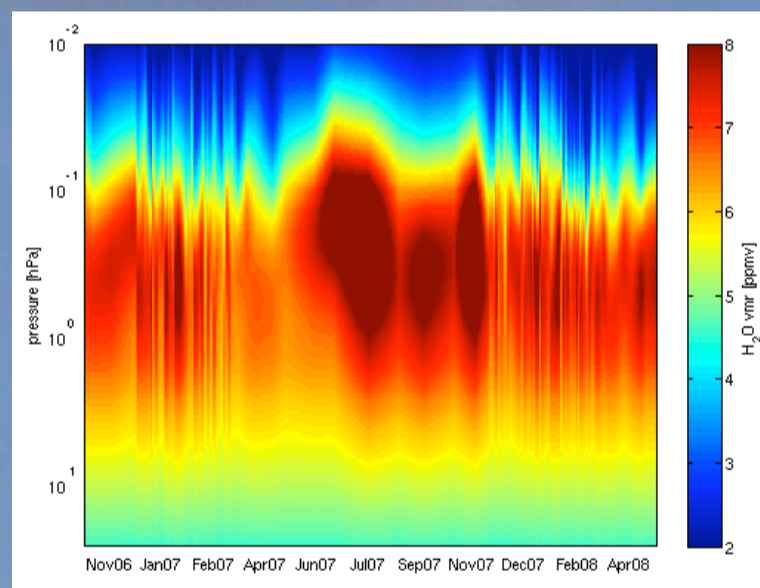


Figure 2: SWARA water vapour profiles for Seoul, S-Korea.

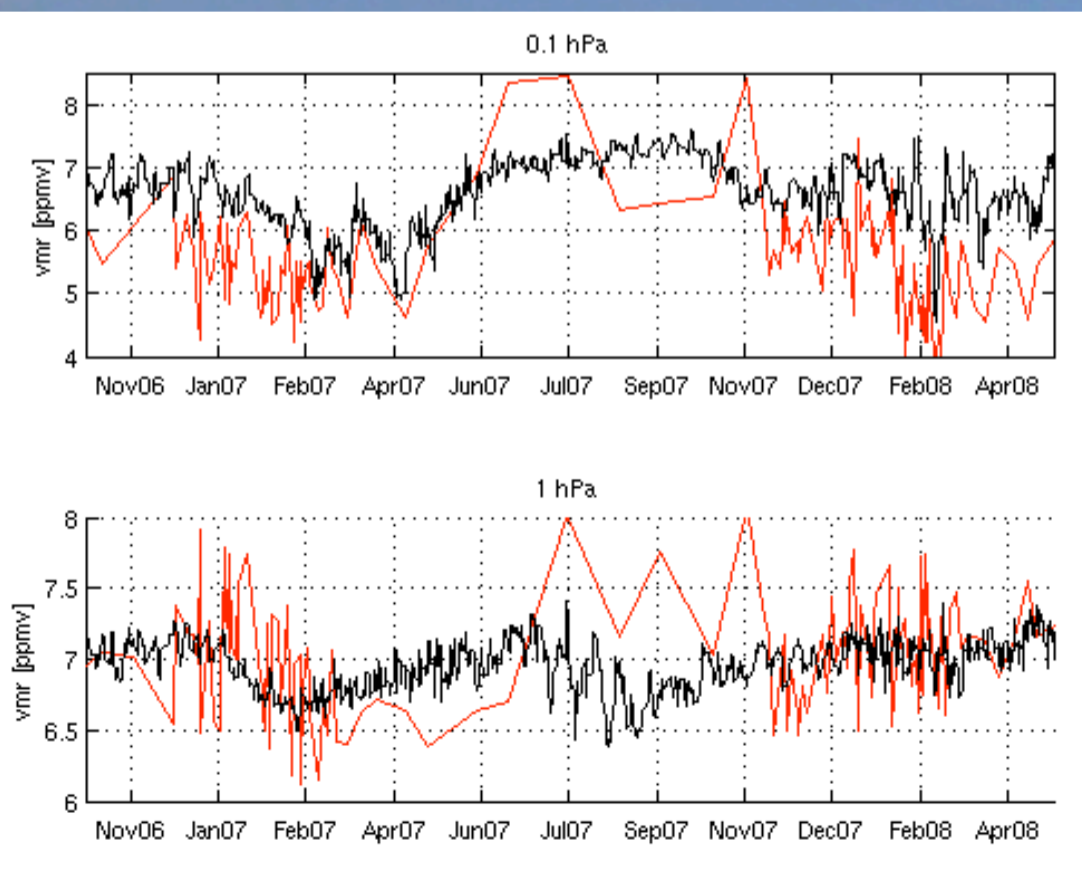


Figure 3: Water vapour volume mixing ratios in ppmv for Aura/EOS MLS data (black) and SWARA (red) for 0.1 hPa (top) and 1 hPa (bottom).

A first validation with Aura/EOS MLS data (Figure 3) shows a good correlation in the higher altitude range [0.1 hPa] (top), but with a bias of around 10%.

High tropospheric opacities in summer lead to longer integration time for the months April to October, giving fewer data points in this time period.

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