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Ground-based water vapour soundings by microwave radiometry and Raman lidar on Jungfrauoch (Swiss Alps)

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Abstract. Water vapour has been measured from the International Scientific Station Jungfrauoch (ISSJ, 47° N, 7° E, 3580m above sea level) during the winters of 1999/2000 and 2000/2001 by microwave radiometry and Raman lidar. The abundance of atmospheric water vapour between the planetary boundary layer and the upper stratosphere varies over more than three orders of magnitude. The currently used measurement techniques are only suited to determine the abundance of water vapour in different atmospheric regimes. None can resolve the vertical distribution profile from ground level to the top of the stratosphere by itself. We present such a water vapour profile where simultaneous measurements from a Raman lidar and a microwave radiometer were combined to cover both the troposphere and the stratosphere, respectively. We also present a study of the stratospheric and tropospheric water vapour variability for the two consecutive winters.

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