

File Revision Date:

Sept. 30, 2019

Data Set Description:

PI: Prof. Dr. Jung Jin Oh
Instrument: Sookmyung Women's University
Site(s): Seoul, South Korea
Measurement Quantities:
Water vapor profile

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Reference Articles:

Lainer, M., Kaempfer, N., Tschanz, B., Neloluha G. E., Ka S., and Oh, J. J., Trajectory mapping of middle atmospheric water vapor by a mini network of NDACC instruments, *Atmos. Chem. Phys.*, 15, 9711~9730, 2015.

Scheiben, D., Tschanz, B., Hocke, K., Kaempfer, N., Ka, S., and Oh, J. J., The quasi 16-day wave in mesospheric water vapor during boreal winter 2011/2012, *Atmos. Chem. Phys.*, 14, 6511-6522, 2014

De Wachter, E., Haeefe, A., Kaempfer N., Ka S., Lee, J. E., Oh, J. J., The Seoul Water Vapor Radiometer for the Middle Atmosphere: Calibration, Retrieval, and Validation, *IEEE Transactions on geoscience and remote sensing*, 49(3), 1052-1062, 2011

Haeefe, A., De Wachter, E., Hocke, K., Kaempfer, N., Nedoluha, G. E., Gomez, R. M., Eriksson, P., Forkman, P., Lambert, A., and Schwartz, M. J., Validation of ground based microwave radiometer at 22 GHz for stratospheric and mesospheric water vapor *Journal of geophysical research*, 114, D23305, 2009

Instrument Description:

The Seoul Water vapor Radiometer (SWARA) is a 22.235 GHz ground-based microwave radiometer for measurement of the middle atmospheric water vapor.

It has been measuring water vapor profile at Sookmyung Women's University in Seoul since 2006. It has been operated by the balancing technique to reduce the signal nonlinearities and the tipping curve technique to estimate the tropospheric opacity at the zenith.

The radiometer is equipped with a digital fast Fourier transform spectrometer with 16384 channels over 1 GHz bandwidth.

Algorithm Description:

The vertical profile of water vapor are retrieved by an optimal estimation method.

The retrieved spectrum has been integrated every 24 hour period, but the actual integration time varies by the weather condition.

The a priori water vapor profile has been used from mean zonal climatology data using AURA MLS v2.2. and atmospheric profiles has been taken from AURA MLS recent profiles.

Expected Precision/Accuracy of Instrument:

The relative error in SWARA water vapor profile is less than 15% between 30 km and 70 km.

Instrument History:

Operational since Oct. 2006

June 2011: upgrade the motor for the mirror movement and control PC.