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Data Set Description:

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Universidad Nacional Autonoma de Mexico (UNAM)
Co-I Wolfgang Stremme, Alejandro Bezanilla (UNAM)
Instrument: Fourier Transform Infrared Spectrometer (FTIR)
Site(s): Altzomoni Observatory
Universidad Nacional Autonoma de Mexico (UNAM)
Izta-Popo National Park
NDACC sub-tropical site
19.1187°N, 98.6552°W, 3985 m a.s.l.

Measurement Quantities: Total Vertical Column Abundances and Profiles above Altzomoni
(in number molecules per cm²)

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Reference Articles:

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For full list of references please see:

<http://www.epr.atmosfera.unam.mx/papers/publications.html>

Online References:

<http://www.ruoa.unam.mx>

Instrument Description:

The spectrometer at the Altzomoni site is an IFS HR120 from Bruker (model year 1988, S/N A58-HI0420), which was upgraded with new Bruker HR125 electronics in 2011. The interferometer consists of various chambers. The source chamber from the original spectrometer used for laboratory measurements at DLR has been removed, and two sources have been installed on an optical table in front of the spectrometer. The optical table is similar to the one used in Izana since 1999. The three chambers allow for a maximal optical path difference of 257 cm that corresponds to a resolution of 0.0035 cm⁻¹.

The Instrumental Line Shape (ILS) is monitored routinely with N₂O or HBr gas cell measurements. Cell spectra are analyzed with the LINEFIT software (F. Hase, 1999). The resulting ILS is used in the retrieval of atmospheric spectra.

Algorithm Description:

PROFFIT 9.6 (Hase, 2003) is used for the inversion of the spectra. PROFFIT is able to retrieve profiles and vertical column abundances of several species in several microwindows simultaneously. For the profile retrieval the Phillipps-Tikhonov approach is used. For some species the inversion is performed on a logarithmic scale to avoid negative vmr values.

PROFFIT also includes a forward model. The synthetic spectra are calculated using daily pressure and temperature data of the National Center for Environmental Prediction (NCEP). Spectroscopic data are taken from HITRAN 2008 data base.

Expected Precision/Accuracy of Instrument:

The error estimate is given for each data point in the data files.

Instrument History:

Dec. 2011	The instruments electronics was updated and mounted to a cointener at KIT
Early. 2012	Start-up of the instrument (IFS 120/5) at Alzomoni Observatory
since 2012	Continuous operation
May 2015	Alzomoni instrument is certified as an official NDACC station
June 2018	Site visit during annual NDACC-IRWG meeting hosted in Mexico