



## **Continuous measurements of volcanic gases from Popocatepetl volcano by thermal emission spectroscopy**

Noemie Taquet, Wolfgang Stremme, Israel Meza, and Michel Grutter

Centro de Ciencias de la Atmósfera, Universidad Nacional Autónoma de México, Mexico City, Mexico

Passive volcanic gas emissions have been poorly studied despite their impact on the atmospheric chemistry with important consequences on its geochemical cycles and climate change on regional and global scale. Therefore, long-term monitoring of volcanic gas plumes and their composition are of prime importance for climatic models and the estimation of the volcanic contribution to climate change.

We present a new measurement and analysis strategy based on remote thermal emission spectroscopy which can provide continuous (day and night) information of the composition of the volcanic plume. In this study we show results from the Popocatepetl volcano in Mexico with measurements performed during the year 2015 from the Alzomoni Atmospheric Observatory (19.12N, -98.65W, 3,985 masl). This site, which forms part of the RUOA ([www.ruoa.unam.mx](http://www.ruoa.unam.mx)) and NDACC (<https://www2.aom.ucar.edu/irwg>) networks, is located north of the crater of this active volcano at 12 km distance. Emission spectra were recorded with an FTIR spectrometer (OPAG22, Bruker) at 0.5 cm<sup>-1</sup> spectral resolution and processed using the SFIT4 radiative transfer and profile retrieval code, based on the Optimal Estimation method (Rodgers, 1976; 1990; 2000). This newly improved methodology is intercompared to a former retrieval strategy using measurements from 2008 and recent results of the variability of the SiF<sub>4</sub>/SO<sub>2</sub> composition ratio during 2015 is presented. A discussion of how the new measurements improve the understating of the impact of volcanic gas emissions on the atmosphere on global and regional scale is included.