Geophysical Research Abstracts,
Vol. 11, EGU2009-698-3, 2009
EGU General Assembly 2009

Solar and lunar absorption and thermal-emission FTIR Spectroscopy used to study and compare gas composition of eruptive and non-eruptive plumes from Popocatépetl volcano

I. Ortega (1), W. Stremme (1), R. Harig (2), and M. Grutter (1)

(1) Centro de Ciencias de la Atmósfera, Universidad Nacional Autónoma de México, UNAM, Mexico City., (2) Institut für Meßtechnik TU Hamburg-Harburg, Germany

The results of two campaigns to study the emission ratios of the Popocatépetl volcanic plumes (19.02° N, 98.62° W, 5465 masl) are presented. The remote sensing measurements were performed from a safe distance of 11 km north of the active volcano at the Altzomoni site. A Fourier-Transform Infrared spectrometer (FTIR) was used in various geometries to record absorption and thermal emission spectra with a 0.5cm-1 resolution. The system is equiped with a scanning device that allows automatic solar and moon tracking at day or night, and accurately finds the highest thermal emission when pointing directly towards the crater. During the first campaign on the morning of the first of December 2007, an explosion of the volcano resulted in the formation of a plume of ash and gases which reached an altitude of 7 km. The wind conditions allowed for solar absorption spectra to be recorded of the eruptive plume from the Altzomoni site. On November 17th 2008, the non-eruptive degassing plume was continuously recorded from both lunar and solar absorption measurements. From both events the HCl/SO2 ratios from solar and lunar spectra are derived and compared using the retrieval code SFIT2. From thermal emission spectra, slant columns for SO2 and SiF4 are retrieved and their ratios as well as the retrieval strategy will be presented. Moon absorption and thermal emission spectra near the moon allow the comparison of SO2-slant columns of the same part of the plume retrieved coincidently with two different methods.