



Side by side inter-comparison of two Fourier Transform Infrared solar absorption measurements retrieval set ups at Popocatepetl Volcano, during the IAVCEI – Gas workshop 2008

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FTIR Solar absorption has been applied for more than 10 years to characterize molecule ratios in volcanic plumes and especially SO₂/HCL ratios provide insight in the magma activities and changes in it. The analyses of the spectra is commonly based on optimal estimation theory (Rodgers, 1976). For a comparison of results measured on different volcanoes or different periods, it is necessary to compare with results measured and analyzed by different groups and instrumentations. For FTIR remote sensing measurements the retrieval method plays an equally important role as the instrumentation. In remote sensing the estimation of the different error sources is complex and validation of the retrieval is desired. In this contribution we describe and present the results of a side by side comparison between two completely different OP-FTIR systems performed during the IVACEI 10th gas work-workshop in Mexico.

On 13 Nov. 2008 on the southeast of Popocatepetl Volcano solar absorption spectra were recorded side by side with 2 portable FTIR spectrometers: a MIDAC (INGV) and a Bruker OPAG-22 (UNAM) both with the a nominal resolution of 0.5 cm⁻¹. The compared retrieval codes are: 1.) The retrieval code normally used by the Italian group has been enveloped/optimized and for more than 10 years applied to volcanic gas emission studies (Burton, 2001) and SFIT2, which is used by the Mexican group and which has been developed by the NASA for studies of the atmospheric composition with high resolution FTIR-spectrometers. Overall we found good agreement between the retrieval results of both groups. The comparison include a (i) blind comparison, (ii) with a matched retrieval strategy and (ii+iii) the analyses of both spectra of one group with the retrievals code of the other.