Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08891, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08891
EGU General Assembly 2008

Improving the accuracy of the SO_2 camera

F. Kick, C. Kern, L. Vogel, M. Wöhrbach, T. Sommer and U. Platt

Institut fuer Umweltphysik, University of Heidelberg, Heidelberg, Germany
(ckern@iup.uni-heidelberg.de / Fax: +49 6221 546405 / Phone: +49 6221 546315)

Sulfur dioxide (SO_2) distributions in volcanic plumes are typically determined via spectroscopic measurements in scanning-mode or through instrument traverses. The SO_2 camera is an imaging device for volcanic emission monitoring that records 2 dimensional images of the SO_2 distribution at a high temporal resolution. It therefore allows the measurement of variations in SO_2 column density that can not be resolved by spectroscopic techniques. Images of the volcanic plume are alternately acquired with a UV-sensitive CCD-camera through two selected bandpass filters. The central wavelength of the first filter is chosen around 310 nm, a wavelength region in which SO_2 absorption is prominent, while the second filter is transparent at around 325 nm and therefore outside the strong SO_2 absorption bands. Intensity ratios of identical picture elements yield the required spectral information for SO_2 detection and quantification.

Several enhancements were made on the SO_2 camera system. For one, the optics were adapted to reduce the angle-dependency effect of the interference-filters. Also, a study was performed to quantify the dependency of the SO_2 calibration on the broadband spectral characteristics of the light conditions at hand. The improved SO_2 camera was tested at Mt. Etna, Italy, and example results of these measurements are given to demonstrate the capabilities of the system.