



Scanning UV Gas Imaging System (SUGIS) applied to study the SO₂ Emission from Popocatepetl volcano

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The passive DOAS technique has become an important tool for observing volcanic emissions. In this contribution, we present the design and some test results of the Scanning UV Gas Imaging System (SUGIS). This device is based on the combination of a UV spectrometer, an azimuth-elevation scanning mirror system, and a notebook PC for control, analysis and image display. The scanning DOAS system allows for real-time analysis of the column densities which are directly visualised in a false colour image. The slant column densities for each pixel are retrieved using a non-linear radiative transfer model in combination with the Levenberg- Marquard algorithm. The system has been applied to study of industrial SO₂ emissions and to observe the SO₂ emissions of an active volcano. Here we will present first results of the system from field measurements of the emissions of the Mexican volcano Popocatepetl.

The results are compared with measurements made simultaneously using the Scanning Infrared Gas Imaging System (SIGIS). Emission rates could be calculated combining the column densities with meteorological data like wind speed and direction. Different approaches were made to estimate the wind speed from the data measured by this remote sensor. Automatic parameterisation of the integration time together with an automatic wavelength calibration using Fraunhofer lines allow for an autonomic observation of the SO₂ emissions.