Geophysical Research Abstracts
Vol. 20, EGU2018-6527-1, 2018
EGU General Assembly 2018

Monitoring of the SO_2 emissions from Nyiragongo volcano using UV camera imaging and spectroscopy during 10 days in June 2017

Hugues Brenot (1), Nicolas Theys (1), Michel Van Roozendael (1), Caroline Fayt (1), Jonas Gliβ (2), Kerstin Stebel (2), Nicolas d'Oreye (3), Mathieu Yalire Mapendo (4), Abel Minani (4), Muhindo Syauswa (4), Benoît Smets (5), and François Kervyn (5)

(1) Royal Belgian Institute for Space Aeronomy (BIRA), Belgium, (2) Norwegian Institute for Air Research (NILU), Norway, (3) European Center for Geodynamics and Seismology (ECGS), Grand Duchy of Luxembourg, (4) Goma Volcano Observatory (GVO), Democratic Republic of Congo, (5) Royal Museum for Central Africa (RMCA), Belgium

From 10^{th} to 20^{th} June 2017, we participated to a field campaign on Nyiragongo volcano, North Kivu, DR Congo. Nyiragongo is one of the most active volcanoes in Africa. It has the largest lava lake on Earth ($\sim$260 m wide) and poses a direct threat to the local population of Goma city ($\sim$800,000 inhabitants). Our field campaign took place within the frame of the RESIST project (Remote Sensing and In Situ Detection and Tracking of Geohazards; http://resist.africamuseum.be). This project aims to gain a more in-depth understanding of the source mechanisms driving volcanic eruptions in the study area. During this campaign, the specific focus was the monitoring of the lava lake dynamics (both vertical and surface movements), the seismic activity and the gas emission. The study presented here, focuses only on the SO_2 monitoring.
During 10 days, SO_2 emissions from Nyiragongo were carried out from four sites, along the crater rim and on the southern flank. Data were recorded with one UV SO_2 camera, two UV-vis spectrometers and a UV scanning-spectrometer. Differential Optical Absorption Spectroscopy (DOAS) was applied in order to retrieve daily time-series of SO_2 amounts (fixed point monitoring, horizontal and vertical plume intersections) from the spectrometers. These estimates are used to calibrate the SO_2 camera, and to investigate the effects of dilution and saturation, that affect SO_2 retrievals. SO_2 time-series and fluxes from the spectrometers were combined with products from the SO_2 camera in order to estimate the daytime periodicity, which is related to the dynamics of the Nyiragongo lava lake.