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Sulphur dioxide from Nyiragongo volcano measured from UV camera

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Nyiragongo and Nyamuragira, DR Congo, are the most active African volcanoes, and pose a direct threat to local populations. The Remote Sensing and In Situ Detection and Tracking of Geohazards project (RESIST; http://resist.africamuseum.be) aims at a more in-depth understanding of the source mechanisms driving volcanic eruptions and landslides in the Kivu region. A key objective of RESIST is to combine complementary data sets from ground-based instrument networks (seismic, infrasound, GNSS), field surveys and Earth Observation techniques (SAR, DOAS, TRMM) to obtain added value information.
This study focuses on retrieving the emission of sulphur dioxide from Nyiragongo, using a ground-based fast sampling UV camera (Envicam3) providing insight on emissions changes, at different temporal scales. This camera has been installed in December 2015 at Rusayo site, located 8 km on the south-east side of Nyiragongo volcano. The view of the camera is generally perpendicular to the mean direction of the wind in this area (NW-SE) giving an opportunity for estimating the SO_2 flux emitted from this volcano. However the Kivu region is a tricky area for operating such an instrument (societal and meteorological reasons). The ideal cloud free conditions are extremely rare in this place and usually restricted to some early morning or the late afternoon time windows. The technique to retrieve SO_2 emission from the UV images requires some knowledge about the background in order to apply the necessary correction. The camera is operating automatically from a fixed point. No clear sky data can be measured on a daily routine. The only way to obtain the background correction is to implement a synthetic background. An automatized strategy to obtain such background will be presented and illustrated with the analysis of one year of data.