



Thermal monitoring of Teide volcano fumarole field by means of an infrared imaging camera

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In order to complete the Volcano Monitoring Network in the Canary Islands, on March 2017 the IGN (National Geographical Institute, Spain) installed a thermal infrared imaging camera on the rim of Teide volcano (3.718 masl) crater in Tenerife (Canary Islands). Inside Teide crater there is a low temperature fumarole field with a maximum temperature of 87°C measured at 50cm depth. Temperature maximum is controlled by water boiling point at this altitude.

A *FLIR A310* infrared thermal camera with a temperature interval of measurement between -20 and 120°C and a 45° angle of vision was deployed. The camera leads us to control an approximate area of 1.000 m² where the main fumarolic vents are located. Along with this instrumentation a *RaspiCam* visual camera with approximate the same field of view was also installed in the same point.

Both cameras are controlled by a *Raspberry Pi 3* and are able to send the recorded images to the IGN dependencies in Santa Cruz de Tenerife in near real time by means of a WiFi link and a 3G modem. The infrared camera takes 5 images every 20 minutes while the visual one takes 1 image every minute.

We present in this work the analysis of the first year of operation dataset from the thermal monitoring system. The evolution of several statistical parameters have been calculated for different areas in the fumarole field, as well as thermal emitted fluxes have been estimated. Meteorological parameters and CO₂ diffuse flux from the soil have also been measured in a nearby location with the aim of comparing them with thermal fluctuations registered in the monitored area.