



Ground-based infrared surveys: imaging the thermal fields at volcanoes and revealing the controlling parameters.

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Temperature monitoring is a widespread procedure in the frame of volcano hazard monitoring. Indeed temperature changes are expected to reflect changes in volcanic activity. We propose a new approach, within the thermal monitoring, which is meant to shed light on the parameters controlling the fluid pathways and the fumarole sites by using infrared measurements.

Ground-based infrared cameras allow one to remotely image the spatial distribution, geometric pattern and amplitude of fumarole fields on volcanoes at metre to centimetre resolution. Infrared mosaics and time series are generated and interpreted, by integrating geological field observations and modeling, to define the setting of the volcanic degassing system at shallow level. We present results for different volcano morphologies and show that lithology, structures and topography control the appearance of fumarole field by the creation of permeability contrasts. We also show that the relative importance of those parameters is site-dependent.

Deciphering the setting of the degassing system is essential for hazard assessment studies because it would improve our understanding on how the system responds to endogenous or exogenous modification.