Satellite monitoring of African volcanoes by means of RSTVOLC

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RSTVOLC is an algorithm for volcanic hot spot detection from space based on the Robust Satellite Techniques (RST) multi-temporal approach. This algorithm was firstly tested on Mt. Etna area, analyzing a long-term time series of infrared Advanced Very High Resolution Radiometer (AVHRR) satellite records, and was then implemented on data provided by the Moderate Resolution Imaging Spectroradiometer (MODIS) to study a number of volcanoes in different geographic areas, including Asamayama (Japan) and Eyjafjallajökull (Iceland). Recently, RSTVOLC has been exported on data provided by geostationary sensors such as the Spinning Enhanced Visible and Infrared Imager (SEVIRI), onboard Meteosat Second Generation (MSG) satellites, allowing for the timely detection and real time monitoring of thermal volcanic phenomena. In this work, recent results achieved studying some important African volcanoes by means of polar and geostationary satellite data are presented. Outcomes and results achieved by RSTVOLC studying some past Ol Donyo Lengai (Tanzania) eruptions and the recent Nyamuragira (Congo) activity are reported and discussed, also for comparison with other independent hot spot detection techniques. This study confirms that RSTVOLC may be successfully used to monitor volcanoes at a global scale and to detect low level thermal activities, thanks to its intrinsic self-adaptivity to different observational/environmental conditions as well as to its high sensitivity to sublte hot spots, contributing to volcanic risk mitigation.