



On the potential of Robust Satellite Techniques (RST) for possible identification of pre-eruptive thermal signals.

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Among the satellite techniques developed for thermal volcanic activity monitoring, an original multi-temporal scheme of data analysis, named RST (Robust Satellite Techniques), has shown high performances in detecting volcanic thermal anomalies possibly related to incoming eruptions. Weak anomalous thermal signals were detected by RST a few days before the Mount Etna eruption of 27 October 2002, just in the area where new fissures opened. This eruption was not preceded by other precursors and emitted voluminous lava flows that destroyed the cable car and other facilities located around the volcanic edifice. The RST implementation on NOAA-AVHRR and EOS-MODIS data acquired over Asamayama (Honshu, Japan) volcanic area, revealed that anomalous thermal signals took place at volcano at least one month before the 1 September 2004 eruption. These signals were independently detected by both satellite systems with some continuity up to the eruption onset. Asamayama eruption was preceded by a long quiescence period of about 21 years, and was probably generated by a rapid magma injection to the shallower part of the conduit occurred since the end of July 2004. In this work results of these studies will be discussed, together with RST potential in detecting pre-eruptive thermal signals even in higher risk volcanic areas (e.g. Vesuvio, St. Helens), where the population density and the eruption styles make possible future eruptions potentially destructive.