On the potential of the parameter "RST-based satellite TIR anomalies" in the framework of a multi-parametric system for time-Dependent Assessment of Seismic Hazard (t-DASH)

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A probabilistic approach using different kind of parameters can be considered to be a helpful approach for improve our present capability to assess seismic hazard in the short term.

Among the different parameters associated with the complex process of preparation of earthquakes, also

fluctuations of Earth thermally emitted radiation, measured by satellite sensors in the Thermal InfraRed (TIR) spectral region, have been, since long-time, considered.

Since 2001, Robust Satellite Technique (RST; Tramutoli 1998, 2005, 2007) showed good performance in discriminating anomalous TIR changes possibly associated to seismic activity from the normal variability of TIR signal due to other causes. Thanks to its full exportability on different satellite packages and the availability of historical data-sets of satellite images, long term correlation analysis between Significant Sequences of TIR Anomalies (SSTAs) - identified by using RST and RETIRA (Robust Estimator of TIR Anomalies; Filizzola et al. 2004, Tramutoli et al. 2005) index - and M≥4 earthquakes have been carried out. Up to now, statistical correlation analyses have been performed in different seismically active areas, such as Greece, Italy, Japan, Taiwan, Turkey and SW-USA. In all testing regions/periods a non-casual relation has been found.

In this paper, we will show the results of performed statistical correlation analyses and we will discuss the potential impact of the use of the "RST-based satellite TIR anomalies" parameter, in a t-DASH (time-Dependent Assessment of Seismic Hazard) multi-parametric system.

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