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On the identification of suitable parameters to be included in a multi-parametric system for t-DASH (time-Dependent Assessment of Seismic Hazard)

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The combined use of independent observations (together with suitable data analysis methods) is expected to strongly improve quality of seismic hazard estimation in the short (weeks) and very short (days) term. However, before whatever integration process, several, not trivial steps, are required in order to identify those parameters that can be usefully included in a multi-parametric t-DASH system.


The candidate parameter should be:

- Likely related to the preparatory phase of an EQ on the base of experimental observations and/or convincing physical models
- To be measurable with sufficient space-time continuity
- To exhibit space-time transients (potentially related to EQs) identifiable through clear, scientifically founded and repeatable, data analysis techniques
- To have a level of correlation among identified anomalies and earthquake occurrence - within a specified space-time window (in term of reciprocal time and position) and depending on EQ magnitude - preliminarily established by long-term (plurennial) correlation analyses.
- To provide appreciable (at least in comparison with a random guess) probability gains justifying their use in the context of a real time multi-parametric t-DASH system

All these aspects will be described in this paper in the case of Earth emitted thermal radiation measured from satellite sensors operating in the Thermal Infrared (TIR) spectral region.

The general change detection approach, named Robust Satellite Technique (RST), and the specific RETIRA (Robust Estimator of TIR Anomalies) index applied to TIR radiances collected by different satellite platforms (MSG, GOES, MTSAT, GMS, etc.) over European (Italy, Greece and Turkey), American (California) and Asian (Taiwan and Japan) regions will be used to evaluate the possible contribute of RST-TIR observations in the framework of a multi-parametric t-DASH system.

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