



Long term analysis of TIR observations over earthquake prone areas: Italy (2004-2012) and Southwestern US (2006-2011)

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The appearance of space-time anomalies in TIR (Thermal InfraRed) satellite imagery, from weeks to days, before severe earthquakes has been reported in several studies. Among the others, a Robust Satellite data analysis Technique (RST) was proposed to investigate possible relations between earthquake occurrence and space-time fluctuations of Earth's emitted TIR radiation. The RST approach is a multi-temporal data analysis strategy which is based on a statistical definition of TIR "anomaly". In the past, RST was already tested in the case of tens of earthquakes occurred in different continents (Europe, Asia, America and Africa). In all test cases, the correlation analysis (in the space-time domain) with earthquake occurrence was carried out by using a validation/confutation approach, in order to verify the presence/absence of anomalous space-time TIR transients in the presence/absence of significant seismic activity. Analyzed periods were always only few months around the time of the considered event (for validation) and a similar (but seismically unperturbed) period in a different year for confutation analysis. In this paper, results of RST analysis are presented:

- for two seismically different regions (the south-western part of the United States of America and Italy)
- by using different satellite sensors (GOES/IMAGER and MSG-SEVIRI)
- by analyzing the whole long-term (6 and 9 years long) datasets

Results will be discussed particularly in the prospective of an integrated approach devoted to systematically collect and analyze in real-time, independent observations for a time-dependent hazard assessment system.