



Applying the RST approach to identify possible pre-seismic Nocturnal Heating Effects: the case of Amatrice (24 August 2016, M6) earthquake

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Since the mid-eighties, the space-time fluctuations of TIR radiation measured by satellite record have been considered as a possible earthquakes precursor (see Tramutoli et al., 2015). As proposed by several authors (Qiang et al., 1991; Tramutoli et al., 2001, 2013) the appearance of anomalously high TIR records near the place and the time of earthquake occurrence could be related to the increase of green-house gases (such as CO₂, CH₄, etc.) emission rates.

Following the original idea of N. Bryant, Bleier et al. (2009) analyzing TIR (Thermal InfraRed) radiances measured by GOES-W satellite, report an apparent “nocturnal heating” in the area where Alum Rock earthquake occurred 13 days later (30 October 2007; M5.4). A similar effect was reported by Piroddi and Ranieri (2012) - using LST (Land Surface Temperature) products retrieved from MSG-SEVIRI radiances – few days before L’Aquila earthquake (6 April 2009; Mw 6.3).

In this work, the multi-purpose change detection method named RST (Robust Satellite Technique; Tramutoli, 1998, 2005, 2007) has been used for studying “nocturnal heating” effect possibly associated to Amatrice earthquake (Mw 6.0) occurred 24 August 2016. To this purpose, TIR records collected by MSG/SEVIRI during nighttime (since 22:00 LT up to 04:50 LT) in the months of July and August from 2004 to 2016 over Italian peninsula have been used. Preliminary results shown TIR anomalies, identified by using the new RETIRSA (Robust Estimator of TIR-Slope Anomalies) index, starting from 2 days up to few hours before the main shock (24 August 2016; Mw 6.0).