



Preliminary results of long term correlation analysis among earthquakes ($M>4$) occurrence and anomalous transients in Radon emission and Earth's emitted TIR radiation in Northeastern Italy

Anna Riggio (1), Stefano Capobianco (2), Nicola Genzano (2,4), Mariano Lisi (2,5), Alberto Tamaro (6), Marco Santulin (7), Giancanio Sileo (2), Valerio Tramutoli (2,3,5)

(1) Istituto Nazionale di Oceanografia e Geofisica Sperimentale – OGS, Trieste, Italy , (2) School of Engineering, University of Basilicata, Potenza, Italy , (3) Institute of Methodologies for Environmental Analysis of the National Research Council, Tito Scalo (PZ), Italy, (4) Graduate School of Science, Chiba University, Chiba, Japan, (5) International Space Science Institute, Beijing, China, (6) Università degli studi di Udine, Trieste, (7) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Milano

Looking toward the assessment of a multi-parametric system for dynamically updating seismic hazard estimates and earthquake short term (from days to weeks) forecast, a preliminary step is to identify those parameters (chemical, physical, biological, etc.) whose anomalous variations can be, to some extent, associated to the complex process of earthquake preparation. Among the other parameters claimed as possible indicators of an impending seismic activity, the anomalous variations of radon emissions and of Earth's thermally emitted infrared radiation (TIR), have been proposed, since long time, as potential earthquake precursors.

In this paper the added value of a multi-parametric approach is evaluated by applying a similar statistical analysis (based on the general RST approach) to long-term time series of Radon and TIR data collected in Northern Italy. Preliminary results of the correlation analysis performed with earthquakes ($M>4$) clearly show a strong reduction of false positive (up to zero) as soon as the number of considered parameter pass from one (just Radon) to two (Radon & TIR anomalies) (contemporary) considered parameters.