



ECHO Project: a series of tools for studying and characterizing seismic sequences evolution

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One of the most ubiquitous problems in seismology is to discriminate between seismic sequences (a series of small-to-moderate earthquakes that culminate with a mainshock) and swarms (diffuse seismicity w/o mainshock), that can be easily done only after a certain class of earthquakes have occurred. We propose to put these phenomena under the same framework provided by the geosystemics (De Santis, 2009, 2014), where the planet Earth and its processes are seen from a holistic point of view, and the New Geophysics (Crampin et al., 2013), where fluid-saturated microcracks in almost all crustal rocks are so closely-spaced they verge on failure and hence are highly-compliant critical systems (Signanini and De Santis, 2012). In this context, nonlinear concepts typical of Chaos and Information theories are fundamental to study and characterize the various features of the series of seismic events, and, eventually, to discriminate between seismic sequences and swarms. The two theories imply the use of non-linear techniques which are innovative in seismology. The project ECHO ("Entropy and CHaOs: tools for studying and characterizing seismic sequences evolution"), a recent INGV-funded project, would aim at applying the above approaches in a more integrated way mainly to establish a suite of effective tools to disclose and characterise the principal features of the series of earthquakes which are of interest. In our view this will represent the very first step before to face the more challenging (but longer-term) problem of discriminating between the two kinds of series of seismic events. This poster will describe these kinds of preliminary activities and relative results in the framework of the project.