



## **Earth's magnetic field anomalies that precede the M6+ global seismic activity**

Gabriele Cataldi (1), Daniele Cataldi (2), and Valentino Straser (3)

(1) LTPA Observer Project, Radio Emissions Project, Albano Laziale, Rome (Italy), (2) LTPA Observer Project, Radio Emissions Project, Lariano, Rome (Italy), (3) International Earthquake and Volcano Prediction Center (IEVPC), Orlando, Florida (USA)

In this work has been analyzed the Earth's magnetic field variations and the M6+ global seismic activity to verify if M6+ earthquakes are preceded by a change of the Earth's magnetic field. The data of Earth's magnetic field used to conduct the study of correlation are provided by the induction magnetometer of Radio Emissions Project's station (Lat: 41°41'4.27"N, Long: 12°38'33,60"E, Albano Laziale, Rome, Italy), equipped with a ELF receiver prototype (with a vertically aligned coil antenna) capable to detect the variations of the intensity of the Earth's magnetic field on Z magnetic component. The M6+ global seismic activity data are provided in real-time by USGS, INGV and CSEM. The sample of data used to conduct the study refers to the period between 1 January 2012 and 31 December 2012.

The Earth's magnetic field variations data set has been marked with the times (time markers) of M6+ earthquakes occurred on a global scale and has been verified the existence of disturbances of the Earth's geomagnetic field in the time interval that preceded the M6+ global seismic activity.

The correlation study showed that all M6+ earthquakes recorded on 2012 were preceded by an increase of the Earth's magnetic field, detected in the Z magnetic component. The authors measured the time lag elapsed between the maximum increment of the Earth's magnetic field recorded before an earthquake M6+ and the date and time at which this occurred, and has been verified that the minimum time lag recorded between the Earth's magnetic field increase and the earthquake M6+ has been 1 minute (9 October 2012, Balleny Islands, M6,4); while, the maximum time lag recorded has been 3600 minutes (26 June 2012, China, M6,3). The average time lag has been 629.47 minutes. In addition, the average time lag is deflected in relation to the magnitude increase.

**Key words:** Seismic Geomagnetic Precursor (SGP), Interplanetary Seismic Precursor (ISP), Earth's magnetic field variations, earthquakes, prevision.