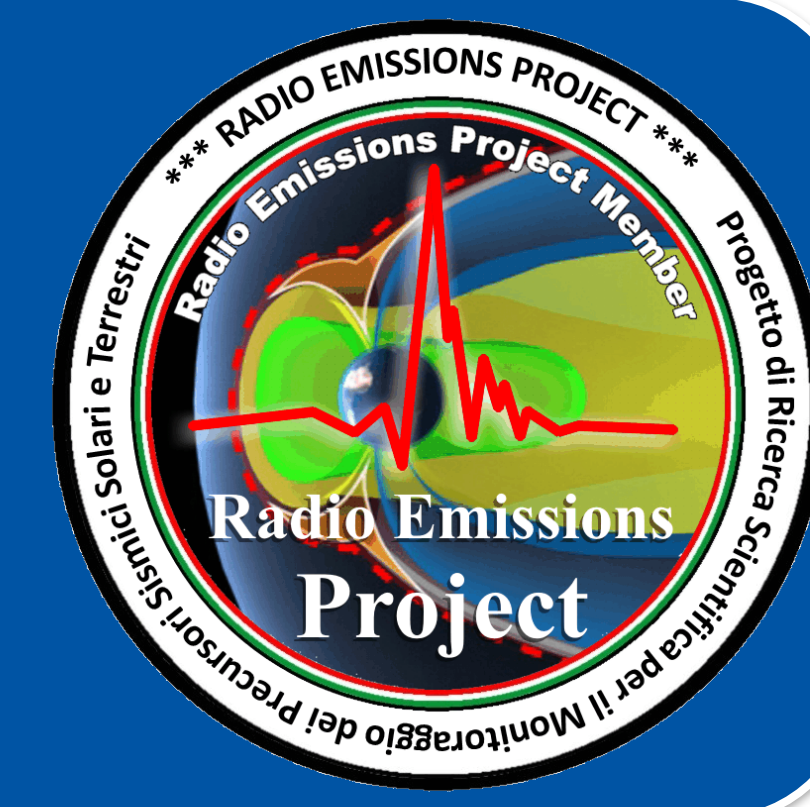


Solar wind proton density increase that preceded Central Italy earthquakes occurred between 26 and 30 October 2016

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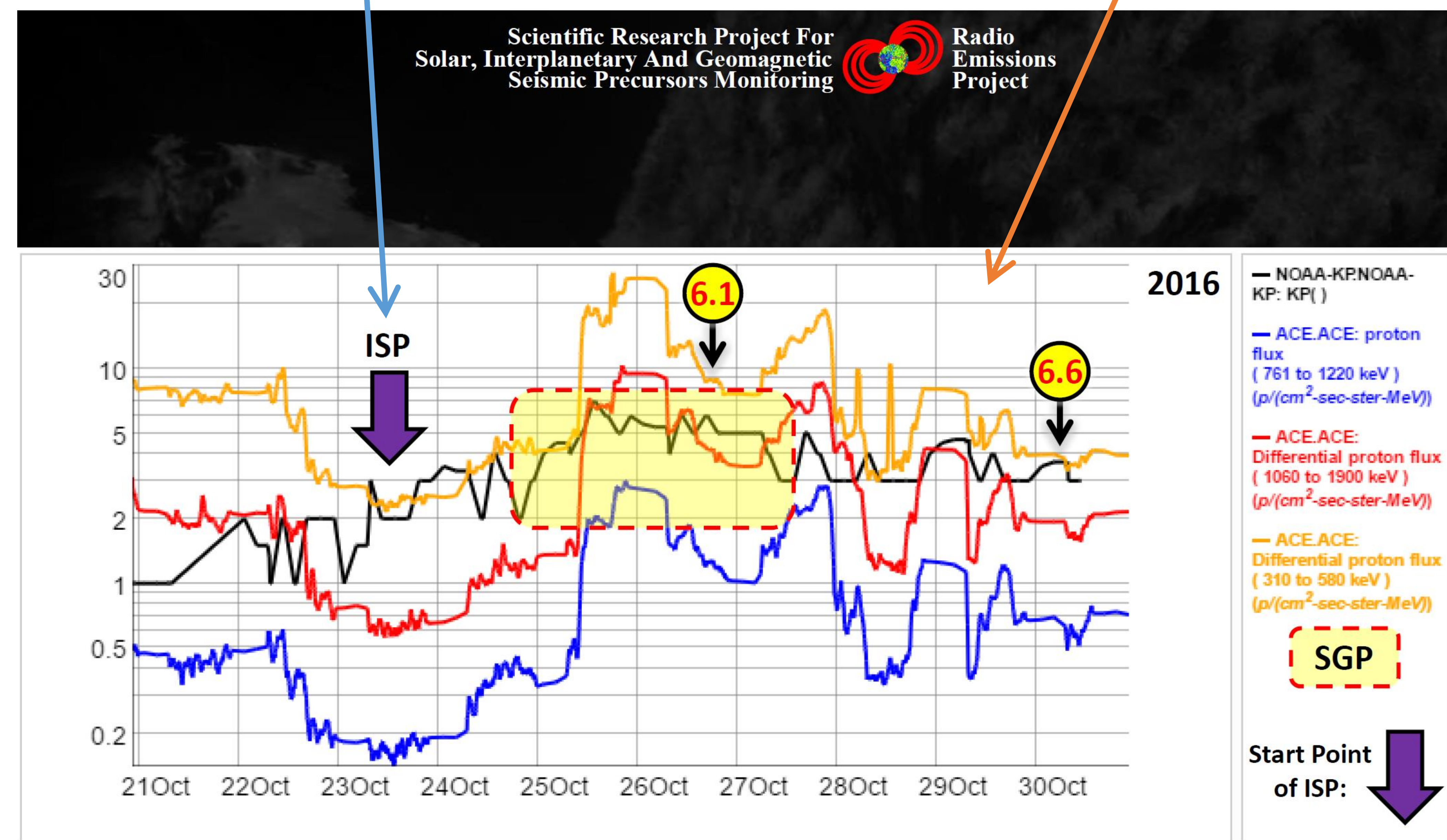


Between 26 and 30 October 2016 in Central Italy were recorded two strong earthquakes: M6.1 occurred on October 26, 2016 at 19:18:08 UTC and M6.6 occurred on October 30, 2016 at 06:40:18 UTC. The authors of this study noted that the two earthquakes were preceded by an increase in the proton density of the interplanetary medium: a phenomenon observed since 2012 and has always preceded the seismic events of high intensity (M6+) occurring on a global scale. To obtain these results the authors have analyzed the conditions of space weather "near Earth" and the characteristics of the Earth's geomagnetic field in the days and in the hours that preceded the two earthquakes.

The variation of the solar wind proton density was found to be the only earthquake precursor can occur prior to any strong earthquake: the authors found that before any strong earthquake (M6+) there was an increase of proton density near Earth. In this poster, the authors highlighted the modulation of the proton density that preceded the two strong Italian earthquakes occurred on October 2016, but the authors have examined the proton variation that preceded all M6+ earthquakes occurred on the Earth from 2012 to date (more than 700 events) and measured the time interval between the beginning of the proton increase and the M6+ earthquakes associated with the variation, this amounts to an average of 141.1 hours.

Start of Interplanetary Seismic Precursor

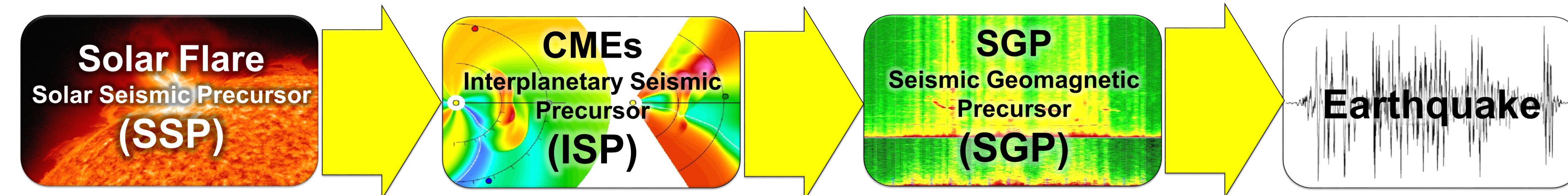
Solar Wind Proton Densitogram



6.1 = Italy (19:18 UTC)
 6.6 = Italy (06:40 UTC)

Data: iSWA, NOAA, ACE Satellite, USGS, Radio Emissions Project

This phenomenon has been classified by the authors as an "Interplanetary Seismic Precursor" (ISP) because it is a phenomenon that precedes the strong earthquakes that can be observed in interplanetary space. Because the solar wind proton density varies in relation to the activity that occurs in the upper atmosphere of the Sun, sunspots, solar flare, coronal holes and magnetic loop represent the substrate through which the proton density undergoes a variation and, therefore, can be classified as "Solar Seismic Precursors" (SSPs). The geomagnetic variation that derives from it is, however, the last type of seismic precursor that the authors have identified and are defined to be "Seismic Geomagnetic Precursor" (SGP).



The solar and geomagnetic activity monitoring is a seismic prediction method that has proven reliable for understanding when we can expect a recovery of the M6+ global seismic and could be used internationally as an indicator of seismic risk in the countries where there are potentially destructive earthquakes and tsunamis.

All that is left do is to create an international task force dedicated to monitoring of solar activity and the Earth's geomagnetic activity to improve this new seismic prediction method that the authors have created since 2012. This will be the new scientific approach that scientists adopt in the seismic prediction context, and it is about time that all the nations of the world to develop new seismic forecasting tools coherent with what has been scientifically demonstrated on seismic precursors since 1980, year in which were observed instrumentally for the first time.