Geophysical Research Abstracts
Vol. 15, EGU2013-8281, 2013
EGU General Assembly 2013

Cross-correlation of solar activity with seismicity and geomagnetic disturbances in Vrancea (Romania) source zone

Iren Adelina Moldovan, Victorin Emilian Toader, Anica Otilia Placinta, Angela Petruta Constantin, and Emilia Popescu

National Institute for Earths Physics, Bucharest, Magurele, Romania (iren@infp.ro, 0040214050673)

The paper brings together, in the same frame, the solar activity, the seismicity and the geomagnetic field behavior. Using statistical approaches, we try to find a degree of correlation between the three phenomena.
On one part, the solar activity influences the geomagnetic field, giving rise to two types of variations: regular and irregular variations. Daily, seasonal and cyclic 11 years period are regular magnetic field variations and arise from current systems caused by regular and periodic solar radiation changes. These regular variations are composed with the irregular variations due to the irregular activity of the Sun. The magnetic activity indices (Ak, Kp, ap and so on) are designed to describe variation in the geomagnetic field caused by the irregular current systems produced by the multiple interactions between the solar wind, the magnetosphere and by the ionosphere itself. The sunspot number has its reflection in the regular 11 years cycle of the geomagnetic activity and the irregular solar currents (ap index) have the reflection in the irregular variations of the geomagnetic activity and is currently used for the identification of magnetic storms. Both are influencing the geomagnetic activity and records.
Tectonic activity, on the other part, sometimes has its own signature on the geomagnetic field.
The data used in this paper are obtained from the seismicity of Vrancea source zone (Romplus catalogue), the geomagnetic field recorded by the Romanian geomagnetic observatories (Muntele Rosu and Surlari NIEP and INTERMAGNET) and the global magnetic activity indices obtained from NOAA. The time span of more than 15 years of recordings is covering more than one solar cycle, giving us the opportunity to study the correlation during low and high solar activity periods.
A special designed software is used for this study. It allows the visualization and analyzing long time intervals of records as seismicity, geomagnetic field and solar activity parameters.