Geophysical Research Abstracts
Vol. 15, EGU2013-3880, 2013
EGU General Assembly 2013

Evaluation of seismic energy evolution

Victorin - Emilian Toader and Alexandru Marmureanu
National Institute for Earth Physics, MAGURELE, Romania (asyst@asystech.ro)

The program analyzes seismicity on a defined area with the use of bulletins (event information) provided by ANTELOPE software. These include earthquake localization (moment, latitude, longitude, magnitude, depth, P and S for each station and other parameters). The evolution of the calculated energy from the Richter magnitude is characterized by steps which can be linearly interpolated. In this way tendencies of energy accumulation / release through tectonic movement can be estimated. Also, it will be calculated and displayed the 'b' coefficient from the Gutenberg – Richter law. The results will be saved as a HTML list which allows global and individual visualization of the seismic forecasts accompanied by the epicenter position on the map. The ANTELOPE users are the first beneficiaries but the program could be modified for other formats of data which include the same information related to the earthquakes localization. The software allows to select the analysis area in which the epicenters are located. In this respect, we are using the free Google Static Maps service (in this case an internet connection is necessary) as well as there is an offline option. In a configuration file the coordinates of the epicenter area has to be defined, the zoom level and the map type if Google Maps is used. The user may redefine the investigation area in online mode. Furthermore, the program allows the selection of the time interval during which the analysis is performed, the configuration of the magnitude and depth intervals, the folders in which the ANTELOPE bulletins are located and where the results will be saved in HTML format. In a separate panel the time intervals between 2 seismic events, the resulted energy from the magnitude conversion (Ml or Md) and magnitudes - depths evolution at which the earthquakes took place can be visualized. During the analysis of the seismic bulletins generated by ANTELOPE, the epicenters are displayed dynamically in the original selected area. This feature allows the successive view of earthquakes (useful if the evolution of the tectonic plate activity is analyzed in time). The user may utilize the HTML page, the magnitude graphs, 'b' or Delta Time (the time interval between two successively earthquakes) in an interactive manner. For the calculus of 'b' two formulas are used (Guttenberg-Richter and Utsu) on a time window (implicit 14 days). The conversion of the Richter magnitude (Md or Ml) in energy is performed in a sliding window, too (typical 7 days). The user has the option of determining for a given time the energy and correspondent magnitude forecast. The reverse transformation between energy and magnitude is done using the differences between the current and estimated values.
The program is a LabVIEW application with GNU (General Public License) license.