

The European Testing Center for source characterization and Earthquake Early Warning: Concepts and Developments.

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In the framework of the EPOS-IP project, we are developing a testing center for earthquake source characterization, with the aim of comparing performance of real-time codes and procedures. The center is grounded on Near-Fault Observatory (NFO) infrastructure. NFOs have modern, dense monitoring infrastructure targeting regions of elevated seismicity and high seismic hazard, and so are natural places where testing and comparing methodologies and software for hazard-related products, such as Earthquake Early warning (EEW) and evolutionary maps of ground shaking while the seismic rupture is still ongoing on the fault plane. Real-time evolutionary source determination and related hazard evaluation at NFOs rely on very dense, possibly multidisciplinary networks deployed around the seismogenic structures with reliable real-time data availability with minimal latency. The NFOs monitor the source regions of many of the recent large earthquakes with significant loss in Europe.

The center will test codes for real-time and offline source characterization and EEW, in terms of their performances to release accurate and fast information about size, location of the ongoing earthquake and prediction of the ground shaking amplitude at specific targets. The initial codes being run are Presto and Virtual Seismologist, though other codes can be included. It is built on independent virtual machines running each of the codes, with each algorithm receiving identical real-time continuous data streams from an operating (seismic) network. Algorithm output is in a standardized format and stored in a database, along with the official reviewed seismicity catalogue. A web interface is developed for performance evaluation. The prototype test center is located in Naples, operating on ISNet, the seismic network associated with the Irpinia NFO, Southern Italy, which has been used to develop the Presto regional EEW system.