EPOS: Integrating seismological Research Infrastructures within Europe

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Seismological data, products and models are currently produced in Europe within individual countries or research organizations, and with the contribution of coordinating organizations like ORFEUS and EMSC. In spite of these partly scattered resources, significant scientific results are obtained, excellent monitoring and information systems are operational and a huge amount of research quality data is being archived and disseminated. The seismological community, however, realizes that an effective European-scale integration of seismological and related geophysical data, products and models, combined with broad and easy access, is needed to facilitate future top level geoscience, for example, to appropriately harness the technological advancements enabling large scale and near-real time data processing. Here we present the technical concepts and developments within European seismology that will build the next generation of integrated services.

Within the EPOS initiative and a number of related projects, where seismology infrastructure and IT developments are merging, in depth discussions are on-going on how to realize an effective integration. Concepts and visions addressing the obviously complex challenges resulting from the current highly distributed facilities and resources in Europe are emerging and are already partly being implemented. We will provide an overview of developments within key EU projects (NERA, VERCE, COOPEUS, EUDAT, REAKT, COMMIT, etc) and demonstrate how these are in coherence with EPOS and other on-going global initiatives.

Within seismology current focus is on addressing IT related challenges to a) organize distributed data archives, develop metadata attributes for improved data searching, specifically including quality indicators, and define products from data and/or models, and b) define and create(on-line) monitoring, data access and processing tools. While developments to meet those challenges originate partly from within the community itself, it is important to harvest relevant ideas and tools from other scientific communities dealing with similar issues. We will present a short summary of those developments and how they fit within the proposed visions and concepts.

These integration developments address a wide framework of seismological services that include: basic seismological data services (waveform data from velocity and acceleration sensors from land and underwater sites); seismological data products (source mechanism and process estimates, earthquake catalogues, structural and tomography model estimations); seismological models (synthetic waveforms, earth and earthquake source models, hazard models).Our aim is to build significantlyimproved seismological services and valuable products for multidisciplinary earth science research.