Report on implementation of the Induced Seismicity Node of the EPOS infrastructure

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Printable Summary

EUROPEAN PLATE Observing System, EPOS, is Europe's largest long-term infrastructure project in the field of earth sciences. EPOS aims to integrate data from existing and new distributed national and regional geophysical monitoring networks, in-situ observatories, and temporary-monitoring and laboratory experiments through a cyber-infrastructure for data mining and processing, and facilities for data integration, archiving and exchange.

The vision is to integrate these existing research infrastructures in order to increase the accessibility and usability of multidisciplinary data from monitoring networks, laboratory experiments and computational simulations enhancing worldwide interoperability in Earth Science by establishing a leading integrated European infrastructure and services.

The EPOS project was approved for the European Strategy Forum on Research Infrastructures (ESFRI) roadmap in 2008. Currently (2011-2014) it is in the Preparatory Phase while it is planned to operate until 2040.

EPOS consists of several working groups (WG) out of which Working Group 10 "Infrastructures for Georesources"will be presented here. WG10 deals with induced seismicity (IS) i.e. seismicity induced by human technological activity, namely:

• Mining Induced Seismicity (MIS): accompanying underground and open cast mining;

• Reservoir Induced Seismicity (RIS): seismicity triggered by the impoundment of surface water reservoirs (hydroelectric power plants);

• Injection/Extraction Induced Seismicity (IEIS): conventional and secondary exploitation of oil and gas, shale gas and other unconventional oil and gas exploitation, geothermal energy production, underground storage of liquids and gases including CCS;

• Exotic e.g. anthropogenic catastrophes with seismic component;

• Cases in Debate (CiD): The origin of some (stronger) earthquakes, whether natural or human induced, remains unresolved.

Induced seismicity is not another kind of tectonic/volcanic seismology. This is a shallow seismicity problem and requires a specific and adequate methodological approach and data collections. Regardless the origin, the IS is controlled primarily by technological processes. This also means that unlike in tectonic seismology, it is can be possible to control IS processes and in particular to reduce hazard of the IS.

The main activities in WG10 are related to design and implementation of the so-called Induced Seismicity Node (ISN). ISN is meant to integrate research infrastructures and research connected with various inducing technologies. This will allow the researchers to focus on solving the common physical problems existing regardless of the type of inducing technology. Since IS is strongly related to inducing technologies, ISN will develop and benefit from a deep synergy between science and industry. The Node is also expected to simplify the data and know-how exchange between researchers, industrial partners and the public. The planned core services of ISN are dedicated to deliver effective tools to operate IS RI that will fulfil existing and future expectations of wide scientific and social community working in the area of induced seismicity.

In this short report we will present a current status of the Induced Seismicity Node activities.

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