The Swiss participation to a network of solid earth Multi-scale Laboratories: EPOS- MSL

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1 Introduction

Geo-labs encompass the most diverse Earth Science Disciplines and typology of data. The Multi-scale Laboratories (MSL), operating in the framework of the European Plate Observatory System (EPOS) aims at facilitating the access and sharing of laboratory data, along with their storage and homogenization. The aim is to evolve beyond the stage in which most of the data produced by labs is available only within scholarly publications or remains unpublished and stored in local devices.

2 The Community

The diversity of methods employed in labs reflects the multi-scale nature of the Earth system and is essential for the understanding of its evolution, for the assessment of geohazards and for the sustainable exploitation of georesources.

In the frame of EPOS the community of European Multi-scale Laboratories is represented by collaborating institutions from eight European countries (Utrecht University, GFZ, RomaTre University, IGG-CNR, INGV, NERC, CSIC-ICTJA, CNRS, LMU, C4G-UBI, ETHZ). It embodies several types of laboratory infrastructures, engaged in different fields of interest in Earth Sciences: from high temperature and pressure experimental facilities, to electron microscopy, micro-beam analysis, analogue tectonic and geodynamic modelling and paleomagnetic laboratories. The data support research activities into Geo-resources and Geo-storage, Geo-hazards and Earth System Evolution.

3 Publish datasets with a DOI & Data repository

At present most data produced by the various laboratory centres are available only in limited “final form” in publications, many data remain inaccessible and/or poorly preserved. MSL is collecting and harmonizing available and emerging lab data in order to generate accessible and interoperable products. MLS offers also the possibility to share data by means of open access, DOI referenced, online data publication, including long-term storage, managing and curation services.

4 Access the labs: Trans-National Access

Access to laboratories is based on professional relations, available budgets, shared interests and other constraints. We aim at reducing the present diversity and non-transparently of access rules by establishing ad-hoc streamlined mechanisms, objective rules and a transparent policy. We work on procedures and mechanisms regulating application, negotiation, evaluation, feedback, selection, admission, approval, feasibility check, setting-up, use, monitoring and dismantling. In the end laboratories should each have a single point providing clear and transparent information on the facility itself, its services, access policy, data management policy and the legal terms and conditions for use of equipment.

5 The Rock Deformation Lab in Zurich

The Rock Deformation Laboratory (RDL) at ETH conducts research on the mechanical behavior and transport properties of Earth materials at conditions pertaining to the Earth’s crust and upper mantle. This is accomplished by means of experimental research coupled with microstructural studies of the micro-scale processes, and modelling of these processes. The RDL is working on a range of problems, including rock deformation, rock physics, elastic wave properties of rocks, volcano-tectonics, coupled thermo-hydro mechanical process in earth crust and deep reservoir characterization.

The laboratory is equipped with a wide range of facilities. We primarily perform experiments at high pressures (up to 500 MPa) and temperatures (up to 1500 K) in gas medium pressure vessels.

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