



## **The Swiss Atlas of Physical Properties of Rocks (SAPHYR): progress and developments**

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A great part of L. Burlini's work has been focused on laboratory measurements of rocks physical properties, and their relations with microstructures. Since the early nineties, he measured seismic wave velocities in rocks from the South-Alpine crystalline basement, and in the following years together with his co-workers, he collected measurements on a wide variety of rocks. The idea to organize all those data into a geographically referenced database (GIS) arrived after about 15 years of activity. Supported by the Swiss Geophysical Commission (SGPK), and together with colleagues from the ETH in Zurich, he initiated a multi-year project, SAPHYR, with the aim to digitize all existing data on physical properties of rocks exposed in Switzerland and surrounding regions. The ultimate goal of SAPHYR is to make these data accessible to an open public including industrial, engineering, land and resource planning companies as well as academic institutions, or simply people interested in geology.

The physical properties, derived from literature or systematically measured, are density and porosity, seismic, magnetic, thermal properties, permeability and electrical properties.

For the time being, data from literature have been collected extensively for seismic and magnetic properties. For the past two years, effort has been placed on collecting samples and measuring the physical properties of lithologies that were poorly documented in the literature. Laboratory measurements are ongoing and in continuous development. A particular effort is put in measuring the temperature derivatives of seismic properties, as routinely procedure, for all collected samples.

Here we present the updated outputs: a density map, and a map with contoured and color-coded values of seismic P-wave velocity, extrapolated to room conditions from the high-pressure laboratory measurements (matrix or crack free properties). These maps will be integrated in the Atlas of Switzerland.

In the coming years the SAPHYR project will shift focus towards developing a 3-D physical properties model of the Swiss subsurface, using the structure of the exposed geology and data from boreholes and seismic surveys, combined with empirically determined pressure and temperature derivatives.