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DESIGN AND IMPLIMENTATION OF A PETROPHYSICAL DATABASE IN AUSTRIA

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The idea of creating a petrophysical database for Austria arose due to the fact that large amounts of physical parameters has been collected at the Institute of Geophysics at the Montanuniversität Leoben. Including data from the rock magnetic laboratory in Gams and the petrophysical laboratory in Leoben an almost complete spectra of physical parameters of some of the most abundant rocks in Austria is available.

International and national research projects, e.g. TRANSALP, have lead to a detailed study of some of the most abundant rocks in Austria. Varieties of limestone, granite, gneiss and volcanic rocks have been collected and measured.

The evaluated physical parameters in the database are: thermal conductivity, compressional and shear wave velocity, seismic attenuation and resonance frequency, magnetic remanence, magnetic susceptibility, palaeomagnetic field intensity and direction, Curie temperature, electrical conductivity, induced polarisation, porosity and grain density.

On one hand these parameters are of great importance for the planning and interpretation of geophysical field surveys, on the other hand they lead to a better understanding of the interaction between components, texture, structure and physical properties of rocks.

Therefore the aim for the future will be to combine the petrophysical data with a geological database, e. g. Lithothek of the TU Graz.

The preliminary design of the data base is given in the following sketch (Fig. 1). Basic information, e.g. as the origin of the rock sample, age, geological formation and further literature etc., can be found in the file “information”. Thin section images and a data-sheet concluding all the available information about mineralogy, petrography, petrology and physical parameters can be downloaded.

An overview of the measured physical parameters gives the table “investigations”.

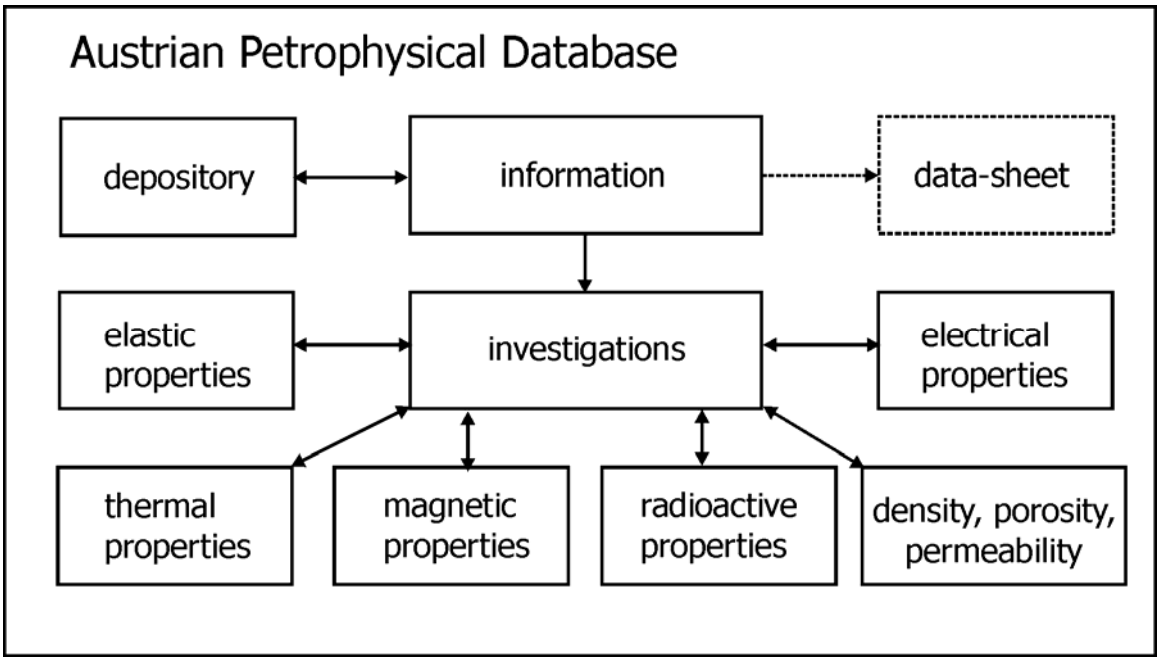

Figure 1: Preliminary concept of an Austrian petrophysical database

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The physical properties are sorted concerning the main geophysical field techniques (Tab. 1).

physical parameters	***geophysical field method***
density, porosity and permeability	gravimetry, NMR, density log, neutron log
elastic properties	seismic, acoustic log
electrical properties	electrical and electromagnetic methods
magnetic properties	magnetic survey, palaeomagnetics, magnetic stratigraphy
radioactive properties	radiometry, geochronology, γ-ray-log
thermal properties	temperature log, geothermal exploration

Table 1: Petrophysical parameters and their relation to geophysical field methods

The depository and the sizes of the stored rock samples are noted in the table “depository” (Fig. 1).
The objective is to implement a database that should be accessible for all earth scientists in Austria. As a database including all abundant rocks in Austria can be achieved only with the collaboration of all earth scientists, colleagues are welcomed to contribute rock samples for petrophysical investigations.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

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