Geophysical Research Abstracts
Vol. 20, EGU2018-12682, 2018
EGU General Assembly 2018

Geothermal exploration in the Danish Basin: Thermal rock properties of Mesozoic formations

Roberto Miele (1,2), Sven Fuchs (2), Niels Balling (3), and Andrea Förster (2)

(1) Department of Biological, Geological, and Environmental Sciences, University of Bologna, Bologna, Italy (miele@gfz-potsdam.de), (2) GFZ German Research Centre for Geosciences, Geothermal Energy Systems, Potsdam, Germany, (3) Department of Geoscience, Aarhus University, Aarhus, Denmark

The Danish subsurface provides a large potential for the use of low-enthalpy geothermal heat and thereby to change the national district heating structure by providing a base load to the system. In the past decade, new exploration and research campaigns have been performed to remove geological, technical and commercial obstacles for a significant use of these geothermal resources. One of the obstacles is the knowledge of thermal rock properties. Subsurface thermal conditions as well as the production capacity and lifecycle of geothermal district heating plants largely depend, among other parameters, on these properties. For the Danish Basin only few published data sets are available and mostly limited to thermal conductivity. Values of thermal diffusivity and specific heat capacity are largely unknown. In order to overcome this gap, new laboratory measurements are conducted. Thermal conductivity and thermal diffusivity are measured on drill cores, while specific heat capacity is calculated based on these values and on rock density. Geological targets for the study are Mesozoic reservoir sandstones (Gassum Fm., Frederikshavn Fm., Haldager Sand), but also mud-/claystones and limestones of formations serving as seals (Fjerritslev Fm., Vedsted Fm.). The sample suite studied comprises rocks from six wells. The measurements are performed under dry and saturated conditions using the optical scanning method.
This study was made possible through support from the project “GEOTHERM” funded by the Innovation Fund Denmark (Grant no 6154-00011B).