



## **Fluid-rock geochemical interaction for modelling calibration in geothermal exploration in Indonesia**

Fiorenza Deon (1), Auke Barnhoorn (1), Caroline Lievens (2), Riskiray Ryannugroho (1,4), Tulus Imaro (1), David Bruhn (1,3), Freek van der Meer (2), Rizki Hutami (4), Besteba Sibarani (4), Rachmat Sule (4), Nenny Saptadij (4), Christoph Hecker (2), Oona Appelt (3), and Franziska Wilke (3)

(1) Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands (F.Deon@tudelft.nl), (2) University of Twente Faculty of Geo-Information Science and Earth Observation, Enschede, the Netherlands, (4) Bandung Institute of Technology ITB, Bandung Indonesia, (3) Helmholtz Centre Potsdam, German Centre for Geosciences, Potsdam, Germany

Indonesia with its large, but partially unexplored geothermal potential is one of the most interesting and suitable places in the world to conduct geothermal exploration research.

This study focuses on geothermal exploration based on fluid-rock geochemistry/geomechanics and aims to compile an overview on geochemical data-rock properties from important geothermal fields in Indonesia. The research carried out in the field and in the laboratory is performed in the framework of the GEOCAP cooperation (Geothermal Capacity Building program Indonesia- the Netherlands).

The application of petrology and geochemistry accounts to a better understanding of areas where operating power plants exist but also helps in the initial exploration stage of green areas. Because of their relevance and geological setting geothermal fields in Java, Sulawesi and the sedimentary basin of central Sumatra have been chosen as focus areas of this study. Operators, universities and governmental agencies will benefit from this approach as it will be applied also to new green-field terrains.

By comparing the characteristic of the fluids, the alteration petrology and the rock geochemistry we also aim to contribute to compile an overview of the geochemistry of the important geothermal fields in Indonesia.

At the same time the rock petrology and fluid geochemistry will be used as input data to model the reservoir fluid composition along with T-P parameters with the geochemical workbench PHREEQC. The field and laboratory data are mandatory for both the implementation and validation of the model results.