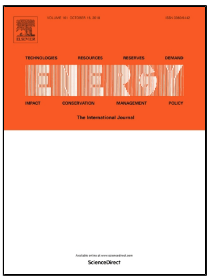
Accepted Manuscript



Enhanced geothermal system modelling with multiple pore media: thermo-hydraulic coupled processes

Musa D. Aliyu, Hua-Peng Chen

PII:	S0360-5442(18)31893-0
DOI:	10.1016/j.energy.2018.09.129
Reference:	EGY 13823
To appear in:	*Energy*
Received Date:	26 March 2018
Accepted Date:	19 September 2018

Please cite this article as: Musa D. Aliyu, Hua-Peng Chen, Enhanced geothermal system modelling with multiple pore media: thermo-hydraulic coupled processes, *Energy* (2018), doi: 10.1016/j.energy.2018.09.129

Enhanced geothermal system modelling with multiple pore media: thermo-hydraulic coupled processes

Musa D. Aliyu[1], Hua-Peng Chen[*]

[1]Department of Engineering Science, University of Greenwich, Chatham, Kent ME4 4TB, U. K.

[*]Corresponding author: hp.chen@outlook.com

Email: m.d.aliyu@outlook.com

Abstract

This paper presents a new numerical model designed to simulate energy mining in naturally fractured-faulted geothermal reservoirs. The model fully couples thermo-hydraulic (TH) processes with triple porosity-permeability properties in a unified geothermal reservoir simulation. This approach enables the investigation of multiphysical phenomena in fractured-faulted formations characterised by multiple pore media. Detailed investigations on the effects of these media on coupled transient fluid and heat flow capture basic features related to energy mining in deep geological formations. Case studies demonstrate that the model can provide a long-term assessment of deep geothermal reservoirs in naturally fractured and faulted porous media. The work provides fundamental insight into the heat transport and fluid flow through multiple pore media and the fracture-fault interface in deep geothermal reservoirs under various conditions and thus, provides a foundation for future research in the field of the enhanced energy recovery from geothermal reservoirs.

Keywords: Enhanced energy recovery, fracture-fault interface, multiple pore media, triple porosity-permeability, numerical modelling, geothermal reservoirs.