

Accepted Manuscript

Development of a hydraulic stimulation simulator toolbox for enhanced geothermal system design

Sehyeok Park, Kwang-II Kim, Saeha Kwon, Hwajung Yoo, Linmao Xie, Ki-Bok Min, Kwang Yeom Kim



PII: S0960-1481(17)31117-5

DOI: [10.1016/j.renene.2017.11.016](https://doi.org/10.1016/j.renene.2017.11.016)

Reference: RENE 9418

To appear in: *Renewable Energy*

Received Date: 13 March 2017

Revised Date: 3 November 2017

Accepted Date: 8 November 2017

Please cite this article as: Park S, Kim K-I, Kwon S, Yoo H, Xie L, Min K-B, Kim KY, Development of a hydraulic stimulation simulator toolbox for enhanced geothermal system design, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.11.016.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 Development of a Hydraulic Stimulation Simulator Toolbox for Enhanced 2 Geothermal System Design

3
4 Sehyeok Park^a, Kwang-Il Kim^a, Saeha Kwon^a, Hwajung Yoo^a, Linmao Xie^a, Ki-Bok Min^{a*},
5 Kwang Yeom Kim^b

6
7 ^a*Department of Energy Resources Engineering,*
8 *Seoul National University (SNU), 1, Gwanak-ro, Gwanak-gu, Seoul, 08826, Republic of Korea*

9 ^b*Korea Institute of Civil Engineering and Building Technology (KICT), 283, Goyang-daero,*
10 *Ilsanseo-gu, Goyang-si, Gyeonggi-do, 10223, Republic of Korea*

11 Corresponding Author (Ki-Bok Min), e-mail: kbmin@snu.ac.kr

12 13 14 Abstract

15
16 Hydraulic stimulation is the key technology in the enhanced geothermal system (EGS)
17 development. In this study, a reservoir stimulation simulator toolbox was developed for the
18 comprehensive EGS design considering the natural fracture distribution, borehole stability, hydraulic
19 stimulation and the thermal performance of the reservoir. The toolbox program consists of five
20 modules, i.e., 3D discrete fracture network (DFN) generation, borehole stability analysis,
21 hydrofracturing estimation, hydroshearing estimation and reservoir temperature prediction. Each
22 module is implemented with graphic user interface using MATLAB[®] and available as a stand-alone
23 program. The program allows independent analysis of each module and combined analyses with
24 compatible data among the related modules, which provides extensive applicability to a variety of
25 tasks associated with EGS stimulation, shale gas fracturing and CO₂ geosequestration.

26 **Keywords:** enhanced geothermal system, hydrofracturing, hydroshearing, discrete fracture network,
27 borehole stability, reservoir temperature

Download English Version:

<https://daneshyari.com/en/article/6765155>

Download Persian Version:

<https://daneshyari.com/article/6765155>

[Daneshyari.com](https://daneshyari.com)