

[Enrollment] the 123rd SEGJ Conference

From: segj@gsct.co.jp

To: myusup_nkh@earth.kumst.kyoto-u.ac.jp; segj@gsct.co.jp

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Thank you for the submission of your abstract to 123rd SEGJ Conference.

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Title of Paper: Interferometric Synthetic Aperture Radar (InSAR) data inversion for Reservoir Monitoring

Author(s) : *Mokhamad Yusup Nur Khakim, Takeshi Tsuji, Toshifumi Matsuoka(Kyoto University)

Presenter : Mokhamad Yusup Nur Khakim

Corresponding author : Mr. Mokhamad Yusup Nur Khakim

Affiliation : Kyoto University

Email Address : myusup_nkh@earth.kumst.kyoto-u.ac.jp

Member : (HAGI)

Contact Address : Zip_code 615-8540, Country Japan, Fax 81-75-383-3203

R118(C1-1), C-cluster, Katsura Kampus, Kyoto

VISA assistance : Yes

Abstract body: As a modern geodetic method SAR interferometry measurement has an ability to estimate a high spatial coverage of displacement maps. It provides an excellent opportunity to analyze physical processes by modeling the source of deformation. Based on Okada's model (Okada, 1985), we successfully inverted surface uplift obtained from InSAR data to reservoir deformations. Using genetic algorithms we were able to estimate the location of displacement sources. While the least-square method was used to efficiently invert the distribution of displacement from the surface uplift data. From the genetic algorithms the depth of displacement sources is 296 meters. The maximum vertical displacement at the depth obtained from least-square inversion is 4.5 cm. The results show that the inversion results have a good agreement with that of real data. Moreover, surface deformations from forward modeling are comparable to real data estimated by InSAR in which has root-mean-square error of 1.2498e-005. Finally, we estimated the total volume change rate of 148346.6692 m³/year considered as the growth of steam chamber. As conclusion, the InSAR technology combined with inversion techniques is powerful tools for monitoring reservoir deformations under production.

Session Preference (application categories) : EOR

Session Preference (technical categories) : Remote_sensing

Presentation Preference : Oral

PC : Own_PC

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