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Acta Geophysica
vol. 62, no. 3, June 2014, pp. 608-619
DOI: 10.2478/s11600-014-0201-1

Applicability of Artificial Intelligence to Reservoir Induced Earthquakes

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Abstract

This paper proposes to use least square support vector machine (LSSVM) and relevance vector machine (RVM) for prediction of the magnitude (M) of induced earthquakes based on reservoir parameters. Comprehensive parameter (E) and maximum reservoir depth (H) are used as input variables of the LSSVM and RVM. The output of the LSSVM and RVM is M. Equations have been presented based on the developed LSSVM and RVM. The developed RVM also gives variance of the predicted M. A comparative study has been carried out between the developed LSSVM, RVM, artificial neural network (ANN), and linear regression models. Finally, the results demonstrate the effectiveness and efficiency of the LSSVM and RVM models.

Key words: earthquake, relevance vector machine, least square support vector machine, prediction.