

عنوان مقاله:

A new stochastic 3D seismic inversion using direct sequential simulation and co-simulation in a genetic algorithm framework

محل انتشار:

مجله معدن و محیط زیست، دوره 8، شماره 3 (سال: 1396)

تعداد صفحات اصل مقاله: 15

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خلاصه مقاله:

Stochastic seismic inversion is a family of inversion algorithms in which the inverse solution was carried out using geostatistical simulation. In this work, a new 3D stochastic seismic inversion was developed in the MATLAB programming software. The proposed inversion algorithm is an iterative procedure that uses the principle of cross-over genetic algorithms as the global optimization technique. The model perturbation towards the objective function is performed recurring to direct sequential simulation and co-simulation. This new algorithm was applied to a synthetic dataset with and without noise. The results obtained for the inverted impedance were satisfactory in both cases. In addition, a real dataset was chosen to be applied by the algorithm. Good results were achieved regarding the real dataset. For the purpose of validation, blind well tests were done for both the synthetic and real datasets. The results obtained showed that the algorithm was able to produce inverted impedance that fairly matched the well logs. Furthermore, an uncertainty analysis was performed for both the synthetic and real datasets. The results obtained indicate that the variance of acoustic impedance is increased in areas far from the well location.

کلمات کلیدی:

Seismic, Acoustic Impedance, Direct Sequential Simulation, Stochastic Seismic Inversion, Genetic Algorithm

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