

عنوان مقاله:

Singular Value Decomposition Assisted Ensemble Kalman Filter for History Matching Problem

محل انتشار:

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خلاصه مقاله:

The application of a recursive technique, the Ensemble Kalman filter, to history matching problem has been considered. An algorithm is simplified in a way of reducing the order of the state vector by using Singular Value Decomposition (SVD). The state vector of the reservoir model is truncated to a few numbers of states corresponding to the largest singular values. The energy of the system is preserved by eliminating the state variables corresponding to the zero singular values or close to zero ones. In this way, the computational time is greatly reduced. Computational effort required for history matching of large reservoirs is a major problem. The algorithm of the proposed method is described by a synthetic model. Finally, it was evident from the simulation results that the application of the Ensemble Kalman filter combined with SVD significantly decreases the computational time of the estimation of unknown geological properties in large reservoirs. Furthermore, the example shows that the estimation results has improved in comparison with the results obtained with a much more expensive approach that estimates states in every grid blocks.

کلمات کلیدی:

History matching, Ensemble Kalman filter, Singular value decomposition

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