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INVERSE AND FORWARD UNCERTAINTY QUANTIFICATION OF RELATIVE PERMEABILITY AND FOAM MODEL PARAMETERS FOR EOR PROCESSES

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In enhanced oil recovery (EOR) processes, foam can be injected into the porous media to reduce gas mobility and increase the recovery factor. Mathematical models of foam injection involve many parameters controlling the complex physics of this process. The quantification of uncertainties in a model is essential for developing robust simulators. However, neglecting some parameters during this analysis can hide important influences and interactions between them and their impact on propagated uncertainties. This work studies a more comprehensive approach for uncertainty quantification of two-phase flow models for foam flow using the same model implemented in STARS/CMG. We present a framework for the inverse and forward uncertainty quantification of Corey's relative permeability model and the apparent viscosity model from STARS with the dry-out component. The study is carried out for each submodel separately and then to the complete model using the Markov Chain Monte Carlo (MCMC) method for inverse uncertainty quantification. Preliminary results show that uncertainties propagated by apparent viscosity are more significant than those propagated by relative permeability models.

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Participation

In person

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