Geophysical Research Abstracts
Vol. 17, EGU2015-15889-1, 2015
EGU General Assembly 2015

Interpretation of Two-Phase Relative Permeabilities through Model Quality Criteria

Leili Moghadasi (1), Alberto Guadagnini (2,3), Fabio Inzoli (1), and Martin Bartosek (4)

(1) Dipartimento di Energia, Politecnico di Milano, Via Lambruschini 4, 20156 Milano, Italy, (2) Dipartimento di Ingegneria Civile e Ambientale, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milano, Italy, (3) Department of Hydrology and Water Resources, Tucson, AZ, 85721, USA, (4) Eni Exploration & Production, Petroleum Engineering Laboratories, 20097 Milan, Italy.

We illustrate the way formal model identification criteria can be employed to provide analyses of laboratory-scale experiments of two-phase relative permeability curves by taking into account the uncertainty associated with mathematical formulation of the interpretive model. We do so by grounding our analysis on a set of empirical two-phase relative permeability models (i.e. Corey, Chierici and LET) which are typically employed in industrial applications requiring water/oil relative permeability quantifications. Our analysis is grounded on a dataset acquired through extensive experimental campaigns as well as published relative permeability curves. Bayesian and information theoretic criteria are applied to rank the alternative models selected and to assign a posterior probability weight to each of them. Our work shows that, in the most cases the complexity of the problem justifies favoring a model with a high number of uncertain parameters over a simpler model structure