

Efficient Quantification of Uncertainties Associated with Reservoir Performance Simulations

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The efficiency and accuracy of a stochastic approach depend on how many (N) terms are required to approximate the underlying random field. In general, with the decrease of the correlation scale (η/L) the critical number of terms (N_c) increases exponentially in order to retain the same level of energy while the required energy level (E_c) decreases exponentially if a certain accuracy in the final solution is desired (a). The net outcome is that with the decrease of η/L , to maintain a certain accuracy N_c increases only slightly (b).

