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Chang Hyeong Lee and **Xingye Kan*** (xkan@umn.edu), 204 Vincent Hall, 206 Church St SE, Minneapolis, MN 55455, and **Hans G. Othmer**. *A Multi-Time-Scale Analysis of Chemical Reaction Networks in Stochastic Description.*

We consider stochastic descriptions of reaction networks in which there are both fast and slow reactions, and the time scales are widely separated. We obtain a reduced equation on a slow time scale by applying a state space decomposition method to the full governing equation and describe our reduction method on the reaction simplex. Based on the analytic results, we approximate reaction probabilities, or so-called propensity functions and present an efficient stochastic simulation algorithm for the slow time scale dynamics. We illustrate the numerical accuracy of the approximation by simulating several motivating examples. (Received September 16, 2014)