

IDENTIFYING SEPARATED TIME-SCALES IN STOCHASTIC MODELS OF REACTION  
NETWORKS

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For chemical reaction networks in biological cells, reaction rates and chemical species numbers may vary over several orders of magnitude. Combined, these large variations can lead to subnetworks operating on very different time-scales. Separation of time-scales has been exploited in many contexts as a basis for reducing the complexity of dynamic models, but the interaction of the rate constants and the species numbers makes identifying the appropriate time-scales tricky at best. Some systematic approaches to this identification will be discussed and illustrated by application to one or more complex reaction network models.