Similarities and differences between stochastic and deterministic models of reaction networks.

If the abundances of the constituent molecules of a biochemical reaction system are sufficiently high then their concentrations are typically modeled by a coupled set of ordinary differential equations (ODEs). If, however, the abundances are low then the standard deterministic models do not provide a good representation of the behavior of the system and stochastic models are used. It is important to understand the similarities and differences in the solutions that come from each modeling choice. I will present two results. The first gives conditions on the network that guarantee both models produce quite stable behavior. The second set of conditions guarantees a special form of stability for the ODE model, but a form of instability for the stochastic model. (Received August 18, 2015)