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Matthew D Johnston* (matthew.johnston@sjsu.edu), San Jose State University, One Washington Square, San Jose, CA 95192, and **David F Anderson**, **Gheorghe Craciun** and **Robert Brijder**. *Extinction and Persistence in Discrete Chemical Reaction Systems*. Preliminary report.

The evolution of a well-mixed chemical reaction system can be modeled as either a deterministic system of ordinary differential equations, which tracks continuous molecular concentrations, or as a stochastic continuous-time Markov chain, which tracks discrete molecular counts. Although the stochastic model is known to converge in probability to the deterministic model in an appropriate scaling limit, surprisingly, many examples are known where the long-term behavior of the two models is starkly different. In particular, the discrete model may permit extinction events not seen in the continuous-state model. In this talk, I introduce methods from Petri Net theory which have been recently applied to chemical reaction systems to given conditions for extinction in the discrete systems. (Received August 09, 2015)