1048-60-314 **David F Anderson*** (anderson@math.wisc.edu), 617 Van Vleck Hall, 480 Lincoln Drive, Madison, WI 53562. *The deficiency zero theorem for stochastically modeled systems.*

The dynamics of chemical reaction networks can be modeled either deterministically or stochastically. The deficiency zero theorem for deterministically modeled systems gives conditions under which a unique equilibrium value with strictly positive components exists within each stoichiometric compatibility class (invariant manifold). The conditions of the theorem actually imply the stronger result that there exist concentrations for which the network is "complex balanced." That observation in turn implies that the standard stochastic model for the reaction network has a product form stationary distribution. (Received February 10, 2009)