1037-92-335 **M. Drew LaMar*** (mdlama@wm.edu), Department of Applied Science, The College of William and Mary, McGlothlin-Street Hall, Rm. 328, Williamsburg, VA 23187, **Hilary DeRemigio**, Department of Applied Science, The College of William and Mary, McGlothlin-Street Hall, Rm. 312, Williamsburg, VA 23187, **Gregory D. Smith**, Department of Applied Science, The College of William and Mary, McGlothlin-Street Hall, Rm. 305, Williamsburg, VA 23187, and **Peter Kemper**, Department of Computer Science, The College of William and Mary, McGlothlin-Street Hall, #006, Williamsburg, VA 23187. *Markov Chain Models of Calcium Release Sites: Kronecker Representations with Exact and Approximate Solution Methods.*

Mathematical models of calcium release sites derived from Markov chain models of intracellular calcium channels exhibit collective gating reminiscent of the experimentally observed phenomenon of stochastic calcium excitability (i.e., calcium puffs and sparks). We present a Kronecker structured representation for calcium release site models and perform benchmark stationary distribution calculations using numerical iterative solution techniques that leverage this structure. We will also compare these solution techniques to more traditional Monte Carlo simulation, closing with a discussion on the use of hierarchical representations and approximate methods to deal with problems with larger state space. (Received February 05, 2008)