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Gangaram S. Ladde* (ladde@uta.edu), Gangaram S. Ladde, Department of Mathematics, P. O. Box 19408, The University of Texas at Arlington, Arlington, TX 76019. *Stability and convergence of large-scale stochastic hereditary systems under markovian structural perturbations*. Preliminary report.

In this work, the study of convergence and stability analysis of a large-scale stochastic hereditary systems under structural perturbations is investigated. The random structural perturbations are described by a Markov chain with a finite number of states. Under algebraic conditions on rate functions, a time-delay, and an intensity matrix associated with the Markov chain, convergence and stability results are obtained. This is achieved through the development and the utilization of comparison theorems in the context of a vector Lyapunov-like functions and the decomposition-aggregation method. Furthermore, the hereditary effects and the effects of random structural perturbations are analyzed. The mathematical conditions are algebraically simple, easy to verify, and robust to the parametric changes in the system. These results are further extended to the integro-differential equations of Fredholm type. (Received January 27, 2005)