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Gangaram S Ladde* (gladde@usf.edu), Department of Mathematics and Statistics, 4202 East Fowler Avenue, PHY 114, Tampa, FL 33620-5700. *Hybrid network dynamic inequalities under hereditary and random perturbations*. Preliminary report.

In this work, a mathematical model for interconnected dynamic phenomenon evolving under hereditary, random and different measure chains with state dependent discrete events is formulated. By introducing an arbitrary pair of functional of a pair of flows (measured dynamic flows), a hybrid network dynamic inequalities with corresponding comparison hybrid network dynamic system is outlined. An arbitrary pair of functional of dynamic flows evolving in two different time scales satisfying an interconnected system of systems of hybrid dynamic inequalities under hereditary and random perturbations is estimated by the corresponding comparison system of systems of impulsive hybrid dynamic equations. Moreover, by employing vector Lyapunov/energy functions as functional of hybrid dynamic flows under the action of both hereditary and random perturbations, several variational comparison results are developed to estimate solution processes of nonlinear nonstationary stochastic hereditary hybrid dynamic system in systematic and coherent manner. The obtained results extend and generalize the existing results in a systematic and unified way. (Received September 22, 2010)