Jinglai Shen* (shenj@umbc.edu), Dept. of Mathematics and Statistics, University of Maryland Baltimore County, Baltimore, MD 21250, and Jianghai Hu. Domain of Convergence of Generalized Input-to-State $\ell_2$-Gains of Discrete-time Switched Linear Control Systems. Preliminary report.

The concept of $L_2$ or $\ell_2$-gains plays an important role in robust control and stability theory. It can be thought as the maximum output energy excited by a given input or perturbation energy. Computation and characterization of $\ell_2$-gains for switched control systems poses a difficult numerical and analytical problem. Recently, a generalized input-to-state $\ell_2$-gain is proposed for discrete-time switched linear control systems. Such an $\ell_2$-gain is characterized by generating functions and can be efficiently computed. In this talk, we discuss more properties of the generalized $\ell_2$-gains. In particular, we introduce the concept of domain of convergence (DOC) of two discount factors in the associated generating function. A variety of analytic properties of the DOC are established, and their implications for analysis and computation of the generalized $\ell_2$-gains are discussed. (Received January 27, 2014)