1166-60-27   **Khwanchai Kunwai*** (`kkunwai@uwm.edu`), 1709 E. Park Place #31, Milwaukee, WI 53211, and **Chao Zhu**. *Regime-switching Jump Diffusion Processes with Countable Regimes : Feller, Strong Feller, Irreducibility and Exponential Ergodicity.*

We study regime-switching jump diffusion processes with countably infinite regimes. Such processes can be used to model complex hybrid systems in which both structural changes, small fluctuations as well as big spikes coexist and are intertwined. Considering the corresponding stochastic differential equations, our main focus is on treating those with non-Lipschitz coefficients. We present weak sufficient conditions for Feller and Strong Feller properties and irreducibility for regime-switching jump diffusion processes. A novel Foster-Lyapunov drift condition is also obtained to derive exponential ergodicity for such processes. (Received February 01, 2021)