Recurrent properties of regime-switching diffusions

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Abstract: Regime-switching diffusion processes can be viewed as diffusion processes in random environments characterized by continuous-time Markov chains. Their recurrent properties are rather complicated. In this talk, we introduce several criteria to justify their recurrent properties based on separatively the theory of non-singular M-matrix, Perron-Frobenius theorem and principal eigenvalues of bilinear forms. These criteria enable us to study the recurrent properties of regime-switching diffusions with infinite countable switching and non-linear coefficients.