

AN INTERACTING DIFFUSION MODEL AND ITS HYDRODYNAMIC LIMIT

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Abstract: We introduce and study an interacting stochastic system of reflected diffusions in two adjacent bounded domains with annihilation occurring near the interface (the common part of the boundaries of two domains) to model transportation of positive and negative charges in solar cells. The new feature is the interaction of two classes of diffusions near the interface. We show that as the number of initial charges tend to infinity, the empirical process of the interacting diffusions converges to a measure-valued process whose density function is deterministic and satisfies a system of coupled parabolic differential equations with non-linear boundary condition at the interface of the media. Propagation of chaos will also be discussed. Based on joint work with Louis Fan.