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Quasi-continuous Charge Transfer via 2D Hopping YUSUF KINKHABWALA, Stony Brook University, VIKTOR SVERDLOV, TU Vienna, KONSTANTIN LIKHAREV, Stony Brook University — We have extended our Monte Carlo simulations of hopping transport in completely disordered 2D conductors to the process of external charge relaxation. In this situation, the conductor shunts an external capacitor C with initial charge $Q_i \sim e$. As the charge relaxes due to random hops of electrons through the conductor, so does the electric field $E = Q_R(t)/CL$ applied to it. At $T \to 0$, the charge relaxation process stops at some "residual" charge value $Q_R < e$ corresponding to the effective Coulomb blockade of hopping. We have calculated the r.m.s. value of Q_R (for the statistical ensemble of conductors with random distribution of localized sites) as a function of parameters of the system, and have found that for conductors with sufficiently large area $L \times W \gg a^2$ (where a is the localization radius) it is a universal function of the ratio $(LW/a^2)/C$ for negligible electron- electron interaction and of the ratio $(LW/a^2)/(\chi C)^2$ for substantial interaction. (Here $\chi = e^2\nu_0 a/\kappa$ is the dimensionless strength of the Coulomb interaction with ν_0 the density of states and κ the dielectric constant.)

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