Abstract Submitted
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Discontinuous quenching of quasi-particle states in nonequilibrium dynamical mean-field theory[1] RYAN HEARY, JONG HAN, SUNY at Buffalo — In an effort to model strongly correlated heterojunctions in nonequilibrium we construct a nonequilibrium dynamical mean-field theory for the Hubbard model where each lattice site is a superposition of a left-moving and right-moving state. The left and right movers have the respective chemical potentials, $\mu_L = \frac{\Phi}{2}$ and $\mu_R = -\frac{\Phi}{2}$, where Φ is the chemical potential bias. The quasi- particle properties are calculated as a function of the Coulomb interaction, U, and Φ. As the chemical potential bias is turned on we find that the quasi-particles become strongly renormalized. When $U_d < U < U_c$, where U_c is the critical U for the metal-insulator transition in equilibrium and $U_d \sim 0.7U_c$, the quasi- particles are destroyed discontinuously at a critical chemical potential bias, Φ_d. For $U < U_d$ the quasi-particles disappear continuously as Φ is enhanced. Therefore U_d is the critical U which defines the boundary between the quasi- particles being continuously and discontinuously suppressed. By defining the quasi- particle energy, ϵ_{QP}, as the half-width at half-maximum of the quasi- particle peak, we find that for $\Phi/\Phi_d \sim 0.4$, the quasi-particle energies scale to a single curve.

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Jong E Han
SUNY at Buffalo

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