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Breakdown of Strong Coupling Expansions for doped Mott Insulators PHILIP PHILLIPS, UIUC, DIMITRIOS GALANAKIS, UIUC, TUDOR STANESCU, Rutgers University — We show that doped Mott insulators, such as the copper-oxide superconductors, are asymptotically slaved in that the quasiparticle weight, Z , near half-filling depends critically on the existence of the high energy scale set by the upper Hubbard band. In particular, near half filling, the following dichotomy arises: $Z \neq 0$ when the high energy scale is integrated out but $Z = 0$ in the thermodynamic limit when it is retained. Slavery to the high energy scale arises from quantum interference between electronic excitations across the Mott gap.

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