Softening of the effective mass of quasiparticles in SU(N) Kondo systems in the intermediate Coulomb interaction regime

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We discuss impact of correlations in SU(N) quantum dot on the effective mass of quasiparticles and shot noise. The quasiparticles are defined within the mean field slave boson approach of Kotliar-Ruckenstein (SBMFA). Employing this approximation we have found partition noise and the mean field corrections to the effective mass. To discuss nonlinear shot noise and the effect of residual interactions on the effective mass we use Fermi liquid theory with parameters expressed by susceptibilities determined within SBMFA. We have found that in the intermediate Coulomb interaction regime the effective mass softens for high degree SU(N) Kondo systems ($N \geq 5$). For strong interactions, effective mass, as expected, is strongly enhanced for all symmetries. The limits of linear Fano factor for strong interactions are determined by symmetry alone and the dependence of nonlinear Fano factor on Coulomb parameter is nonmonotonic for high rank symmetries. It reflects a competition of two- and three-particle correlations.