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Exact-diagonalization treatment of the non-universal transport regime in few-electron quantum dots[1] LESLIE O. BAKSMATY[2], CONSTANTINE YANNOULEAS, UZI LANDMAN, School of Physics, Georgia Institute of Technology — Recently, experimental studies[3] have revealed a distinct second transport regime in the behavior of transmission phases obtained via Aharonov-Bohm interferometry using small quantum dots (QDs); namely, a non-universal regime for QDs with $N < 10$ electrons, in addition to the earlier known universal one for larger QDs with $N > 14$. Sophisticated (beyond-the-mean-field) many-body methods are needed for describing this non-universal regime. Here, we study the transport properties of small QDs using exact-diagonalization (EXD) calculations in conjunction with Bardeen's theory of quasiparticle mediated conductance.[4] We will present EXD calculations[5] for anisotropic QDs, and for a wide range of anisotropies and strengths of inter-electron repulsion.

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[3]M. Avinun-Kalish *et al.*, Nature **436**, 529 (2005)
[4]For an adaptation of the formalism to QDs, see S.A. Gurvitz, arXiv:0704.1260v1
[5]C. Yannouleas and U. Landman, Rep. Prog. Phys. **70**, 2067 (2007)

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