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The universal Hamiltonian of chaotic quantum dots in the presence of spin-orbit interaction Y. ALHASSID, Center for Theoretical Physics, Yale University, DANIEL HUERTAS-HERNANDO, T. BEBIS, T. RUPP — In a chaotic dot with a large number of electrons only a few interaction terms survive and constitute the interacting part of the so-called universal Hamiltonian. The universal Hamiltonian was derived in the absence of spin-orbit scattering. The presence of spin-orbit scattering in chaotic (or diffusive) quantum dots was shown to introduce new symmetry limits of the single-particle Hamiltonian [1]. We derive the universal Hamiltonian (i.e., including interaction terms) in the presence of spin-orbit scattering in these new symmetry limits, both in the absence and presence of an orbital magnetic field. We also derive closed expressions for the finite temperature conductance through such dots and use them to study the conductance peak height and peak spacing statistics. We identify interesting statistical signatures of the interplay between spin-orbit and exchange interactions. This work has been supported in part by the Department of Energy grant No. DE-FG-0291-ER-40608. [1] I.L. Aleiner and V.I. Fal'ko, Phys. Rev. Lett. **87**, 256801 (2001).

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