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Understanding zero-bias anomalies in disordered strongly-correlated electron systems: An atomic-limit perspective[1] RACHEL WORTIS, LISTER MULINDWA, Trent University — Many interesting phenomena arise in strongly-correlated electron systems which are disordered, either intrinsically or due to doping. In trying to understand these phenomena, the single-particle density of states provides a useful bridge between theory and experiment. Progress has recently been made in understanding the origins of the zero-bias anomaly that appears in these systems, and how this zero-bias anomaly differs from that studied by Altshuler and Aronov in weakly-correlated systems . Because both interactions and disorder reduce the importance of kinetic energy, the atomic limit provides a useful perspective. The case of long-range 1/r interactions in the atomic limit was addressed by Efros and Shklovskii, who showed the density of states is suppressed to zero at the Fermi level. However, the argument they used does not address screened interactions or the effect of double occupancy. This talk presents classical Monte Carlo results for the density of states in the atomic limit of the extended Anderson-Hubbard model. The origin of the zero-bias anomaly in this system is explained, and the results are compared both with those obtained when hopping is allowed and with those of Efros and Shklovskii.

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