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Effects of Strong Correlations on the Disorder-Induced Zero Bias Anomaly WILLIAM ATKINSON, Trent University, YUN SONG, Beijing Normal University, SINAN BULUT, RACHEL WORTIS, Trent University — In conventional metals and semiconductors, density of states anomalies result from the interplay between disorder and interactions. Motivated by a number of experiments that find zero bias anomalies (ZBA) in transition metal oxides, we have performed calculations to determine the effect of strong correlations on the ZBA in disordered interacting systems. We use a self-consistent mean-field theory that incorporates strong correlations and treats spatial fluctuations of the disorder potential exactly. We discuss both the Anderson-Hubbard model and the extended Anderson-Hubbard model. We find that, even for a zero-range interaction, nonlocal self-energy corrections lead to the formation of an Altshuler-Aronov-like ZBA. In the extended Anderson-Hubbard model, Efros-Shklovskii-like physics dominates at large disorder.

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