

Abstract Submitted
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The infrared catastrophe and tunneling into a correlated conductor KELLY PATTON, MICHAEL GELLER, The University of Georgia — It is well known that the tunneling density of states has anomalies (cusps, algebraic suppressions, and pseudogaps) at the Fermi energy in a wide variety of low- dimensional and strongly correlated electron systems. We propose that the origin of these anomalies is the infrared catastrophe associated with the sudden introduction of a new electron into a conductor during a tunneling event. We introduce an exact functional integral representation for the interacting Green's function, by means of a Hubbard-Stratonovich transformation, single out the field configurations responsible for the infrared catastrophe, and treat them with methods developed for the X-ray edge problem. Applications to a variety of interacting systems will be presented.

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