

Abstract Submitted
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Friedel sum rules for one- and two-channel Kondo models and unitarity paradox via bosonization-refermionization approach¹ MAXIM KHARITONOV, NATAN ANDREI, PIERS COLEMAN, Center for Materials Theory, Rutgers University, Piscataway, NJ 08854, USA — We calculate the single-particle Green’s functions and scattering amplitudes of the one-channel and channel-anisotropic two-channel Kondo models at the Toulouse and Emery-Kivelson lines, respectively, where exact solutions via the bosonization-refermionization approach are admitted. We demonstrate that in this approach the Friedel sum rules – the relations between the trapped spin and “flavor” moments and the scattering phase shifts in the Fermi-liquid regime – arise naturally and elucidate on their subtleties. We also recover the “unitarity paradox” [1,2] – the vanishing of the single-particle scattering amplitude at the channel-symmetric point of the two-channel Kondo model – stemming from non-Fermi-liquid behavior. We discuss the implications of these results for the development of composite pairing in heavy fermion systems.

[1] A. W. W. Ludwig and I. Affleck, Phys. Rev. Lett. 67, 3160 (1991).

[2] J. M. Maldacena and A. W. W. Ludwig, Nucl. Phys. B. 506, 565 (1997).

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