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Quantum critical dynamics of a magnetic impurity in a semiconducting host[1] NAGAMALLESWARARAO DASARI, Theoretical Sciences Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, 560064, India., SWAGATA ACHARYA, Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur 721302, India., A TARAPHDER, Centre for Theoretical Studies, Indian Institute of Technology Kharagpur, Kharagpur 721302, India., JUANA MORENO, MARK JARRELL, Department of Physics & Astronomy, Louisiana State University, Baton Rouge, LA 70803, USA, N. S. VIDHYADHIRAJA, Theoretical Sciences Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, 560064, India., PROF. N. S. VIDHYADHIRAJA COLLABORATION, PROF. MARK JARRELL COLLABORATION, PROF. A. TARAPHDER COLLABORATION — We have investigated the finite temperature dynamics of the singlet to doublet continuous quantum phase transition in the gapped Anderson impurity model using hybridization expansion continuous time quantum Monte Carlo. Using the self-energy and the longitudinal static susceptibility, we obtain a phase diagram in the temperature-gap plane. The separatrix between the low-temperature local moment phase and the high temperature generalized Fermi liquid phase is shown to be the lower bound of the critical scaling region of the zero gap interacting quantum critical point. We have computed the nuclear magnetic spin-lattice relaxation rate, the Knight shift, and the Korringa ratio, which show strong deviations for any non-zero gap from the corresponding quantities in the gapless Kondo screened impurity case.

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