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State of the Polaron: Criticality in the Spin Boson Model

ZACH BLUNDEN-CODD, Imperial College London, AHSAN NAZIR, University of Manchester, ALEX CHIN, University of Cambridge — In strongly coupled open quantum systems it can become necessary to take into account the behaviour of environmental degrees of freedom more rigorously than is usual with standard weak coupling techniques. We investigate the use of a variational ansatz, making use of a multitude of coherent states, to obtain more precise information about the interaction between an open system and its environment. We provide a thorough study of the ground state of the ubiquitous spin boson model; presenting analytic and numerical results concerning the nature of its much debated quantum phase transition.

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