

Abstract Submitted  
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**Spectrum and screening cloud in the central spin model**<sup>1</sup> SEBASTIAN EGGERT, Univ. of Kaiserslautern, Germany, MICHAEL BORTZ, Univ of Kaiserslautern, Germany, JOACHIM STOLZE — We consider an electronic spin in a quantum dot, coupled to the surrounding nuclear spins via inhomogeneous antiferromagnetic hyperfine interactions and subject to a uniform field, which is described by Gaudin’s central spin model. We study spectral properties, the two-point correlation functions, and the magnetization profile in the ground state and in low-lying excited states, which characterizes the structure of the cloud of nuclear spins screening the electron spin. A close connection to the pair occupation probability in the BCS-model is established. Using the exact Bethe Ansatz solution of that model and arguments of integrability, we can distinguish between contributions from purely classical physics and from quantum fluctuations.

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