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Integrability-based analysis of the hyperfine interaction induced decoherence in quantum dots ALEXANDRE FARIBAULT, DIRK SCHURICHT, RWTH Aachen — Using the Algebraic Bethe Ansatz in conjunction with a simple Monte Carlo sampling technique, we study the problem of the decoherence of a central spin coupled to a nuclear spin bath. We describe in detail the full crossover from strong to weak external magnetic field field, a limit where a large non-decaying coherence factor is found. This feature is explained by Bose-Einstein-condensate-like physics which also allows us to argue that the corresponding zero frequency peak would not be broadened by statistical or ensemble averaging.

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