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Relaxation of the general solution for Richardson-Gaudin models

RAZVAN TEODORESCU, IGOR ALEINER, Columbia University — The algebro-geometric solution for the reduced BCS model describing small superconducting Al grains is investigated. The solution is derived using methods from the theory of integrable systems. Fluctuations of the spectrum induced by stochastic external fields are considered in the framework of random matrix theory. Incorporating the effects of these fluctuation through the averaging principle leads to a modified evolution equation, in general not integrable. Estimates for the relaxation time for the soliton-type solutions of Richardson- Gaudin models are computed.

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