

Exact partition function and spectral properties of supersymmetric BC_N type rational integrable models with polarized spin reversal operators

P. Banerjee, B. Basu-Mallick, N. Bondyopadhaya and C. Datta *

Complete energy spectrum as well as exact partition functions for a class of BC_N type of spin Calogero models, whose Hamiltonians are constructed by using supersymmetric analogues of polarized spin reversal operators (SAPSRO) have been calculated. The strong coupling limit of these spin Calogero models yields BC_N type of Polychronakos - Frahm (PF) spin chains with SAPSRO. By applying the freezing trick [1], we obtain an exact expression for the partition functions of such PF spin chains. Studying the energy spectrum of BC_N type of PF chains with SAPSRO, we verified that an extended boson-fermion duality relation is obeyed by the corresponding partition functions. Further, we investigate some spectral properties like level density distribution, nearest neighbour spacing distribution and ratio of consecutive level spacings for such spin chains.

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References

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*P. Banerjee is with P. R. Thakur Govt. College, Thakurnagar, Gaighata, 24 Parganas (North), West Bengal, India, Email: pratyaybanerjeesinp@gmail.com; B. Basu-Mallick is with Saha Institute of Nuclear Physics-HBNI, Bidhannagar, Kolkata-64, Email: bireshwar.basumallick@saha.ac.in; N. Bondyopadhaya is with Integrated Science Education and Research Centre, Visva-Bharati University, Santiniketan-731235, India, Email: nilanjan.iserc@visva-bharati.ac.in; and C. Datta is with Saha Institute of Nuclear Physics-HBNI, Bidhannagar, Kolkata-64, Email: chitralekha.datta@saha.ac.in.