Cornell University Library

We gratefully acknowledge support from the Simons Foundation and member institutions

arXiv.org > nucl-th > arXiv:1106.5237

Search or Article-id (Help | Advanced search) All papers Go!

Nuclear Theory

The Heine-Stieltjes correspondence and the polynomial approach to the standard pairing problem

Feng Pan, Xin Guan, Mingxia Xie, Lina Bao, J. P. Draayer

(Submitted on 26 Jun 2011)

A new approach for solving the Bethe ansatz (Gaudin-Richardson) equations of the standard pairing problem is established based on the Heine-Stieltjes correspondence. For k pairs of valence nucleons on n different single-particle levels, it is found that solutions of the Bethe ansatz equations can be obtained from one (k+1)x(k+1) and one (n-1)x(k+1) matrices, which are associated with the extended Heine-Stieltjes and Van Vleck polynomials, respectively. Since the coefficients in these polynomials are free from divergence with variations in contrast to the original Bethe ansatz equations, the approach thus provides with a new efficient and systematic way to solve the problem, which, by extension, can also be used to solve a large class of Gaudin-type quantum many-body problems and to establish a new efficient angular momentum projection method for multi-particle systems.

Comments:	ReVTeX, 4 pages, no figure
Subjects:	**Nuclear Theory (nucl-th)**; Strongly Correlated Electrons (cond-mat.str-el); Mathematical Physics (math-ph); Quantum Physics (quant-ph)
Cite as:	**arXiv:1106.5237 [nucl-th]**
	(or **arXiv:1106.5237v1 [nucl-th]** for this version)

Submission history

From: Feng Pan [view email]

[v1] Sun, 26 Jun 2011 17:06:23 GMT (8kb)

Which authors of this paper are endorsers?

Link back to: arXiv, form interface, contact.

Download:

- PDF
- PostScript
- Other formats

Current browse context:
nucl-th
< prev | next >
new | recent | 1106

Change to browse by:
cond-mat
cond-mat.str-el
math
math-ph
quant-ph

References & Citations
- INSPIRE HEP (refers to | cited by)
- NASA ADS

Bookmark(what is this?)