DYNAMIC PROBES OF QUANTUM SPIN CHAINS: MULTI-FERMION EXCITATION CONTINUA

Oleg Derzhko[1], Taras Krokhmalskii[1], Joachim Stolze [2] and Gerhard Müller[3]
[1]Institute for Condensed Matter Physics NASU,
1 Svientsitskii Str., L'viv-11, 79011, Ukraine
[2]Institut für Physik, Universität Dortmund, 44221 Dortmund, Germany
[3]Department of Physics, University of Rhode Island,
Kingston, Rhode Island 02881-0817, USA

9.7 cm

We calculate analytically the dynamic dimer and trimer structure factors of the one-dimensional spin-1/2 XX model in a transverse magnetic field at any temperature. In the framework of the Jordan-Wigner approach the accessible spectrum of the dimer (trimer) fluctuation operator is limited to two-fermion (two- and four-fermion) excitations. We examine some features of the four-fermion excitation continuum and compare them with the well known properties of the two-fermion continuum. Finally, we discuss the experimental relevance of the calculated structure factors. Our calculations extend the list of exact results for dynamic properties of quantum spin chains.
Further details can be found in Ref. 1.
This study was performed within the framework of the STCU project #1673.

[1] O. Derzhko, T. Krokhmalskii, J. Stolze, and G. Müller, Phys. Rev. B (accepted).

13.4 cm

Subject category :
6. Theory of Magnetism

Presentation mode :
poster

Corresponding author :
O. Derzhko

Address for correspondence :
Institute for Condensed Matter Physics NASU
1 Svientsitskii Street
L'viv-11, 79011, Ukraine

Email address :
derzhko@icmp.lviv.ua