

UNION OF DISCRETIZED SPECTRA FOR SCATTERING CALCULATIONS

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Solving scattering problems in L2 bases is a perspective way which allows to treat problems for continuum nearly on the same footing as the discrete spectrum ones. Recently we have suggested a new technique for reconstructing scattering amplitude directly from discretized spectra of the total and asymptotic Hamiltonians found with variational method [1]. It was shown also how the discretized spectra of the Hamiltonians obtained using different bases of the same dimension can be united into the common set. Apart other advantages, such a union of discretized spectra (UDS) leads to a much denser grid for spectrum discretization without increasing an actual basis dimension.

In this study, the technique based on the UDS is generalized to multi-channel problems with degenerated continuum. For practical calculations, a non-orthogonal Gaussian basis is used which is known to be very convenient for few-body bound-state problem. It is expected that it is for Gaussian basis sets that the UDS method will be effective for calculations in few-body continuum, as was shown for the single-channel case [1]. As illustrations, we consider the use of UDS for solving two-body multi-channel scattering problems, as well as for finding multi-channel resonances.

1. O.A. Rubtsova, V.N. Pomerantsev, J. Phys. A 55, 095301 (2022).

The speaker is a student or young scientist

No

Section

1. Nuclear structure: theory and experiment

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