

Solving Few-Body Scattering Problems in a Discrete Representation by using GPU

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Different aspects of the Wave-Packet Continuum Discretization method [1] are discussed in application to solving few-body scattering problems in free space and in medium. After a projection of the operators and wave functions into a discrete wave-packet representation, integral equations of the scattering theory are replaced with matrix ones. The necessary boundary conditions are taken into account by using the finite-dimensional (matrix) representations for the free and channel resolvents. The numerical scheme of the solution can be highly parallelized and realized on an ordinary PC within the GPU technique [2]. The approach is illustrated by elastic scattering and breakup amplitudes in the 3N system. The developed discretization method is shown to be efficient in solving scattering equations in nuclear matter theory.

- [1]. O.A. Rubtsova, V.I. Kukulin, V.N. Pomerantsev, *Annals of Physics* **360**, 613 (2015).
- [2]. V.N. Pomerantsev, V.I. Kukulin, O.A. Rubtsova, S.K. Sakhiev, *Computer Physics Communications* **204**, 121 (2016).