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From few-body to many-body problems

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<p>Problems involving bound states of few particles can be solved exactly since the number of degrees of freedom are small. Several methods in this direction exist. One of these is the Integro-differential equation approximation method (IDEA). These few-body methods have been succesfully applied to obtained bound and scattering states for three- and four-body problems for nuclear and molecular systems.

On the other hand, calculating observables for many-body systems, such as Bose-Einstein condensates, is quite involved. Approximations at different levels, i.e. formalism and numerical, are necessary. In this work we show that the IDEA method can be extended to many-body systems via the transformation of the kernel, and this transformation accelerate convergence quite dramatically. Examples of molecular systems consisting of particles upto 1000 atoms are handled quite easily. Technical aspects of the method are discussed.

Level (Hons, MSc,
   PhD, other)?

other

Consider for a student
   award (Yes / No)?

No

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

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