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## From few-body to many-body problems

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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 successfully applied to obtain 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 accelerates convergence quite dramatically. Examples of molecular systems consisting of particles up to 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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