



Contribution ID: 135

Type: **Poster**

## **Hyperspherical harmonics expansion on Lagrange meshes for bosonic systems in one dimension**

*Thursday 5 September 2019 19:10 (20 minutes)*

A one-dimensional system of bosons interacting with contact and single-Gaussian forces is studied with an expansion in hyperspherical harmonics. The hyperradial potentials are calculated using the link between the hyperspherical harmonics with single-particle harmonic oscillator basis and the coupled hyperradial equations are solved with the Lagrange-mesh method. Extensions of this method are proposed to reach a good convergence with small numbers of mesh points for any truncation on hypermomentum. The convergence on hypermomentum strongly depends on the range of the two-body forces: it is very good for large ranges but deteriorates with their decrease, being the worst for the contact interaction. In all cases the lowest order energy is within 4.5% of exact solution and shows the correct cubic asymptotic behaviour at large boson numbers. Details of convergence studies are presented for 3, 5, 20 and 100 bosons and a special treatment for three bosons was found to be necessary. For gaussian interaction, the convergence rate improves with increasing boson numbers, similar to three-dimensional systems of bosons.

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**Session Classification:** Poster Session

**Track Classification:** Posters