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Calculation of ^{6}Li ground state within the Hyperspherical Harmonic basis

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The so called *ab-initio* methods in nuclear physics permits to solve the full A-body Hamiltonian considering realistic potentials. Among the various *ab-initio* approaches, the Hypespherical Harmonic(HH) method has been successfully applied in studying bound states and low-energy scattering process of $A = 3$ and $A = 4$ system [1]. The extension of the HH method to $A \geq 5$ results to be limited by the large amount of states needed for constructing the Hamiltonian matrix element up to convergence. However, the use of the brute force parallelization combined with some new computational approach opens the door to use it for larger systems. In this Talk we will introduce the computational solutions used to construct the HH basis and the potential matrix elements in systems larger than $A = 4$. Then we will present, as first results of this new computational approach, the calculation of the ^{6}Li wave function discussing also its electromagnetic structure and the $\alpha + d$ clusterization.

[1] A. Kievsky, S. Rosati, M. Viviani, L.E. Marcucci, and L. Girlanda, J. Phys. G: Nucl. Part. Phys. **35**, 063101 (2008)

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