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Applying Efimov physics to few nucleon systems

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Efimov physics has been intensively studied in the L=0, spatially symmetric state of the three-boson system. In the case of three nucleons, the three and four-body systems have a large symmetric component allowing the study of Efimov physics. To be recalled in this context the large values of the singlet and triplet two-nucleon scattering lengths. In this presentation we will show results for low energy observables using simple potential models with variable strength. In this way the dependence with the triplet and singlet scattering length values can be analyzed, in particular at the unitary limit, $1/a=0$. On the other hand, at the physical values of the scattering length and using a three-body force different observables can be quantitatively reproduced as the doublet and quartet n-d scattering lengths, the low energy s-wave n-d phases and the binding energies of the ground and excited states of the alpha particle. The impact in the six nucleon system will be analyzed.

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