Few-nucleon systems and low momentum potentials MICHELE VIVIANI, ALEJANDRO KIEVSKY, INFN-Pisa, LAURA E. MARCUCCI, SERGIO ROSATI, Pisa University — Over the last few years, there has been a noticeable progress in the understanding of the nuclear interaction, in particular in the development of new “low-momentum” potentials, as those based on the chiral effective field theory or the renormalization group approach. All these potential models have to be tested primarily in the $A = 3, 4$ systems. The hyperspherical harmonic (HH) and the correlated hyperspherical harmonic methods (CHH) are powerful techniques for solving $A = 3, 4$ bound and scattering problems. For example, the long-range Coulomb interaction between protons can be taken into account straightforwardly. Recently, we have extended these methods to treat non-local potentials given in momentum space, as is the case of the new “low-momentum” potentials. These potentials are by construction very soft, and therefore the direct application of the HH approach is very convenient for them. In this contribution, several properties of the $^3$H and $^4$He nuclei, and $N - d$ and $p - ^3$He scattering observables, as derived from some of the low-momentum potentials, will be presented and discussed.

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