

K- and eta nuclei

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This contribution reports on our recent calculations of K- and eta quasi-bound states in nuclear systems using subthreshold energy dependent Kbar-N and eta-N amplitudes [1-4].

Many-body K- nuclear systems were calculated within a chirally motivated meson-baryon coupled-channel model due to Cieply and Smejkal [5]. Self-consistent evaluations yield K- potential depths $-ReV_K$ of order 100 MeV. Dynamical polarization effects and two-nucleon absorption modes are discussed. The widths of all K- nuclear quasi-bound states are comparable or even larger than the corresponding binding energies, exceeding considerably the energy level spacing [2].

The strong energy dependence of the s-wave eta-N scattering amplitude was included self consistently in eta nuclear bound state calculations within several underlying eta-N models. Binding energies and widths of eta nuclear states were calculated for nuclei across the periodic table [3,4], including 25Mg for which some evidence was proposed in a COSY experiment [6].

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[4] A. Cieply, E. Friedman, A. Gal, J. Mares, Nucl. Phys. A 925 (2014) 126.

[5] A. Cieply, J. Smejkal, Nucl. Phys. A 881 (2012) 115.

[6] A. Budzanowski et al (COSY-GEM Collab.), Phys. Rev. C 79 (2009) 012201(R).

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