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Single vs multi nucleon absorption processes in low-energy K-nuclei interactions

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One of the most interesting aspects of low energy QCD in a strangeness sector is to understand how hadron masses and interactions change in the nuclear environment. The antikaon-nucleon potential is investigated searching for signals from possible bound kaonic clusters. The existence of such objects is very debated, and it would open the possibility for the formation of very dense baryonic matter and imply a deep attractive antikaon-nucleon potential.
In our work, as a first step of the AMADEUS experiment, data from KLOE measurements (from 2004-2005) were used to study Λp, Λd and Λt correlations - channels expected to decay into K^-pp, K^-ppn and K^-ppnn clusters respectively. This channels give the opportunity to investigate single and multi-nucleon absorption processes, important for disentangling these processes from possible signal due to the formation of a bound state. Theoretical calculations are giving large range of values for the binding energy and the width of the predicted states, so more experimental data are needed to reveal this puzzle.

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