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Kaon-nuclei ineraction studes at low energies (the AMADEUS experiment)

The AMADEUS experiment [1,2] aims to perform dedicated precision studies in the sector of low-energy kaon-nuclei interaction at the DAFNE collider at LNF-INFN. In particular, the experiment plans to perform measurements of the so-called (very debated) deeply bound kaonic nuclei and, if existent, to measure their properties (binding energies and widths) by using the process of stopped kaons in cryogenic gaseous targets (He3 and He4). AMADEUS will measure all particles coming from negative kaons stopped in these targets, so performing a full study of various interaction channels. Other important measurements proposed by AMADEUS are the low-energy interaction studies of negative kaons in various targets. The kaon beam is ideal (low-energy kaons from the phi-decay at DAFNE) and the setup, an implementation in the central region of the KLOE detector with dedicated additional items, is having very good performances (high acceptance and capacity to measure charged and neutral particles with excellent resolution).
The results of AMADEUS will give a boost to the sector of non-perturbative QCD in the strangeness sector. The physics program, preliminary results from analysis of KLOE data and future plans will be presented.

[1] AMADEUS Letter of Intent,{ http://www.lnf.infn.it/esperimenti/siddharta/LOI_AMADEUS_March2006.pdf}

[2] The AMADEUS collaboration, LNF preprint, LNF–07/24(IR) (2007).

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