

# AMADEUS experiment: Studies on antikaon interactions with nucleons and nuclei

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The understanding of the low-energy strong interaction involving strangeness is a challenging topic due to strongly debated resonances and predicted kaonic nuclear bound states. Important experimental information on the interactions of antikaons with nucleons and nuclei is still missing. These questions are also related to the role of strangeness in neutron stars. The K- nucleon interaction is strongly attractive at low energies verified in kaonic hydrogen studied in the SIDDHARTA experiment at the DAΦNE electron-positron collider of LNF-INFN (Frascati/Italy). Hyperon resonances like the elusive  $\Lambda(1405)$  in the s-wave impose questions about its nature. According to recent theoretical studies it can be described as a dynamically generated resonance with two poles. Other studies claim that  $\Lambda(1405)$  is a quasi-bound state K-p, which could lead to kaonic nuclear bound states with multiple nucleons like the prototype system K-pp which is searched in different experiments. An insight in many open facets of the antikaon interactions can be provided by the AMADEUS experiment at DAΦNE based on the KLOE detector. As a first step data from antikaon-induced reactions in the drift chamber of KLOE were analyzed and yielded new results on antikaon absorption on nuclei. The physics topics of the planned AMADEUS project will have a wide range from (anti)kaon scattering in the unexplored low momentum region to studies of absorption processes taking advantage of the low-energy kaon source provided by DAΦNE and the KLOE  $4\pi$ -detector system for neutral and charged particles. Recent results of the experimental studies and an outlook to the future possibilities within AMADEUS will be presented.

## Summary

The physics topics of the AMADEUS at LNF-INFN (Frascati) project will have a wide range from (anti)kaon scattering in the unexplored low momentum region to studies of absorption processes taking advantage of the low-energy kaon source provided by DAΦNE and the KLOE  $4\pi$ -detector system for neutral and charged particles. Recent results of the experimental studies with data taken by KLOE and an outlook to the future possibilities within AMADEUS will be presented.

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