

Kaonic Atoms at DAΦNE - the SIDDHARTA Experiment

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With precision X-ray spectroscopy of kaonic hydrogen at the DAΦNE electron-positron collider at Laboratori Nazionali di Frascati the chiral symmetry breaking scenario in the strangeness sector will be investigated by studying the K^-p s-wave interaction at threshold. This is possible by observing the strong interaction induced shift and width of the 1s state in kaonic hydrogen atoms.

The results of a first measurement at LNF with DEAR (DAΦNE Exotic Atom Research) [1] has already gained strong interest by theory as indicated by the number of new published results. An overview of the experimental as well as theoretical status will be given.

The SIDDHARTA (Silicon Drift Detector for Hadronic Atom Research with Timing Application) [2] project will be described, which is aiming at a substantial improvement of the preceding DEAR result. The goal of SIDDHARTA is to determine shift and width with a precision of a few eV and to perform a first measurement of kaonic deuterium. By measuring these observables (kaonic hydrogen and deuterium) the isospin-dependent s-wave hadron-hadron scattering lengths at zero energy can be extracted, which are a sensitive measure of the chiral and isospin symmetry breaking pattern in QCD.

[1] G. Beer, et al., Phys. Rev. Lett. 94 (2005) 212302.

[2] J. Zmeskal, in: A. Hirtl, J. Marton, E. Widmann, J. Zmeskal (Eds.), Proceedings EXA05, Austrian Academy of Science Press, Vienna, 2005, p. 139.

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