Strangeness in Quark Matter 2019



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Kaonic atoms at DAFNE to access the strong interaction with strangeness at threshold

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The X-ray measurements of kaonic atoms play an important role for understanding the low-energy QCD in the strangeness sector. The energy shift and broadening of the lowest-lying states of

such atoms, induced by the kaon-nucleus strong interaction, can be determined with high precision from atomic X-ray spectroscopy.

Significant achievements have been obtained by the SIDDHARTA experiment at the DAFNE electron-positron collider of LNF-INFN, among which: the most precise kaonic hydrogen measurement of the 1s level shift and width to date, fundamental information for the low-energy Kp interaction in theoretical studies; an upper limit of the X-ray yield of kaonic deuterium, important information for future Kd experiments.

Using the experience gained with SIDDHARTA experiment, new X-ray studies focused on kaonic deuterium are in preparation in the framework of the SIDDHARTA-2 experiment, with the goal to determine the isospin dependent scattering lengths, which is only possible by combining the Kp and the upcoming Kd results. This experimental method provides unique information to understand the low energy kaon-nucleus interaction at threshold.

Collaboration name

SIDDHARTA-2 Collaboration

Track

Upgrades and new experiments

Primary author: SIRGHI, Diana Laura (INFN-LNF)Presenter: SIRGHI, Diana Laura (INFN-LNF)Session Classification: Poster session with "aperitivo"