

ROCKSTAR: Towards a Roadmap of the Crucial measurements of Key observables in Strangeness reactions for neutron sTARs equation of state

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E57 Kaonic Deuterium at J-PARC

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Exotic hadronic atoms are a valuable tool to experimentally investigate the strong interaction described by Quantum Chromodynamics (QCD). With kaonic hydrogen/deuterium atoms one can directly measure the interaction at threshold and will be able to extract the antikaon-nucleon scattering lengths at zero energy (no interpolation to zero energy is necessary as in scattering experiments). The antikaon-nucleon interaction close to threshold provides crucial information on the interplay between spontaneous and explicit chiral symmetry breaking in low-energy QCD. Kaonic hydrogen was measured successfully with SIDDHARTA and DEAR at DAFNE (LNF, Italy) and with KpX at KEK (Japan). A measurement of kaonic deuterium is still missing and just now ongoing at DAFNE. A second measurement with different systematic corrections is prepared at J-PARC. The kaonic deuterium data will allow for the first time, together with the already existing kaonic hydrogen data, the determination of the isospin dependent antikaon-nucleon scattering lengths a_0 and a_1 , eagerly awaited by theory.

An overview of the status of the proposed kaonic deuterium measurement at J-PARC will be given.

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