

Kaonic X-ray experiments at DAFNE using SIDDHARTA

Tuesday, 22 May 2007 18:50 (20 minutes)

At the DAFNE electron-positron collider of Laboratori Nazionali di Frascati we study kaonic atoms, taking advantage of the low-energy kaons produced in the phi-meson decay. The kaon-nucleon interaction at rest in kaonic hydrogen and kaonic deuterium can be investigated under favorable conditions. The DEAR (DAFNE Exotic Atom Research) experiment at LNF delivered the most precise data on kaonic hydrogen up to now. DEAR and its follow-up experiment SIDDHARTA (Silicon Drift Detector for Hadronic Atom Research by Timing Application) are using X-ray spectroscopy of kaonic atoms to measure the strong interaction induced shift and width of the ground state. From these quantities the isospin-dependent antikaon-nucleon scattering lengths can be determined, quantities useful to test the understanding of chiral symmetry breaking in the strangeness sector. Within the SIDDHARTA project new X-ray detectors are being developed. We will use an array of large area silicon drift detectors (SDDs) having excellent energy resolution but also providing timing capability which will result in a huge suppression of background and so overcome the precision limits of the former experiments. With this experimental technique the measurement of kaonic deuterium X-rays will be feasible for the first time.

Primary authors: CARGNELLI, Michael (Austrian Academy of Sciences - Stefan Meyer Institute); SIDDHARTA COLLABORATION

Presenter: CARGNELLI, Michael (Austrian Academy of Sciences - Stefan Meyer Institute)

Session Classification: Session III

Track Classification: Low energy QCD