

X-ray Spectroscopy of Kaonic Atoms at DAΦNE

A. Romero Vidal^(a) on behalf of the SIDDHARTA Collaboration

^(a) Laboratori Nazionali di Frascati - INFN (Rome)

The SIDDHARTA experiment aims a precise measurement of K-series kaonic hydrogen x-rays and the first-ever measurement of the kaonic deuterium x-rays to determine the strong-interaction energy-level shifts and widths of the lowest lying atomic states. These measurements offer a unique possibility to precisely determine the isospin-dependent kaon-nucleon (KN) scattering lengths [1] which are directly connected with the physics of the KN interaction. Kaonic Helium transitions to the 2p level (L-lines) were as well measured. The experiment has been performed at the DAΦNE e^+e^- collider which produces the Φ -resonance. The resulting low energy negative charged kaons, coming from the Φ decay, are well suited to be stopped efficiently in a high density gas target for producing such kind of atoms. As x-ray detectors, we employed 144 Silicon Drift Detectors developed especially for this experiment, having good energy resolution of 140 eV FWHM at 6keV and time resolution of sub-micro seconds. The data taking was completed in November 2009. In this talk, an overview of this experiment and recent results will be presented, together with future plans.

[1] J. Zmeskal, Progr. Part. Nucl. Phys. 61 (2008) 512.

E-mail: Antonio.RomeroVidal@lnf.infn.it