

KAONIC HELIUM3 AND KAONIC HELIUM4 MEASUREMENTS IN THE SIDDHARTA EXPERIMENT AT DAΦNE COLLIDER

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The SIDDHARTA experiment (Silicon Drift Detector for Hadronic Atom Research by Timing Application) had the aim to perform kaonic atoms X-ray transitions measurements, with the goal to better understand aspects of the low-energy QCD in the strangeness sector.

The experiment combined the excellent low-energy kaon beam generated at DAΦNE, allowing to use gaseous targets, with excellent fast X-rays detectors: Silicon Drift Detectors. SIDDHARTA was installed on DAΦNE in autumn 2008 and took data till late 2009.

Apart of the kaonic hydrogen and kaonic deuterium measurements, we have performed the kaonic helium transitions to the 2 level (L-lines) measurements: for the first time in a gaseous target for helium4 [1] and for the first time ever for kaonic helium3 [2]. The interest for such type of measurement was rather high, being it triggered by two reasons: the so-called “kaonic helium puzzle” (even if this was solved by KEK-PS E570 experiment [3], but a cross-check was useful) and some theoretical predictions of possible high energy shift (at the level of 10 eV).

In this presentation the results for the measurements to the 2p level (L-series) for kaonic helium4 and kaonic helium3 are presented.

[1] M.Bazzi,*et al.*, Physics Letters B 681 (2009) 310.

[2] M.Bazzi,*et al.*, Physics Letters B 697 (2011) 199.

[3] S. Okada,*et al.*, Physics Letters B 653 (2007) 387.