

X-ray spectroscopy of kaonic atoms at SIDDHARTA

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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 SIDDHARTA experiment studied the X-ray transitions of 4 light kaonic atoms (H, D, ^3He and ^4He) using the DAFNE electron-positron collider at LNF (Italy). The most precise values of the shift and width of the kaonic hydrogen 1s state were determined, which are now being used as fundamental information for the low-energy K-p interaction in theoretical studies. The yields of kaonic hydrogen K-series transitions and of the kaonic ^3He and ^4He L-series were measured, the upper limit of the X-ray yields of kaonic deuterium was determined, important for future K-d experiments. The shifts and widths of the kaonic ^3He and ^4He 2p states were analyzed, solving the “kaonic helium puzzle” both for the shifts and widths. In this contribution, the experimental approach and the results of SIDDHARTA will be presented, and the plans of the new experiments of kaonic deuterium, will also discussed.

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