

A New Silicon Drift Detector System for the Kaonic Deuterium Measurement

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The measurement of kaonic deuterium atoms provides an ideal setting to gather information about the strong interaction of particles with strangeness at low energy. In the E57 experiment at J-PARC and with SIDDHARTA-2 at DAΦNE the shift and width of the K-d 1s state will be determined by using newly developed Silicon Drift Detectors (SDDs) as a high precision x-ray detector. For both experimental setups the detector consists of 48 SDD arrays in different arrangements, which will measure the emitted X-rays of the kaons when cascading from an excited state to the ground state.

The E57 set-up uses amplifier boards, developed at the SMI, including a digital logic part to provide a single gate output for 8 SDD channels. Furthermore, the cable length between SDDs and amplifier boards has to be longer than one metre, which made the development of a line-driver unit necessary.

First test measurements, simulating the final E57 set-up, with a Fe-55 source were performed for SDD temperatures below 170K. The achieved results, fulfilling all the necessary requirements, will be shown.

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