

Contribution ID: 18

Type: **not specified**

Towards new intermediate-mass kaonic atoms measurements with novel CdZnTe X-ray detectors at DAFNE

Tuesday 10 October 2023 16:15 (15 minutes)

The SIDDHARTA-2 collaboration at the INFN Laboratories of Frascati aims to reinforce the present knowledge on kaonic atoms by performing several measurements on various targets in parallel with the main K-d experiment.

The recent improvements of CdZnTe detectors in terms of energy resolution, stability and efficiency suggested these devices as ideal tools to measure intermediate-mass kaonic atoms; nevertheless, no literature about the use of CdZnTe detector in a collider was found, requiring preliminary tests to assess their on-beam behavior and response in DAFNE.

Here we present the very promising results of these preliminary tests performed in 2023, as well as the detailed MC simulations developed for the optimization of the experimental setup which is going to be installed on the DAFNE machine in 2024.

We aim to measure, with a few tens of eV precision, energies and widths of several K-Al and K-C transitions both to their lower and upper levels, and the estimations of the achievable results, based on MC simulation, will be reported.

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Session Classification: Session IV