MATTER AND TECHNOLOGIES

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Room-temperature readout electronics for the ECHo-100k experiment

Recent advances in the development of cryogenic particle detectors, such as magnetic microcalorimeters (MMCs), allow the fabrication of sensor arrays with an increasing number of pixels. One use-case, the ECHo-100k experiment with 10,000 MMCs, promises high sensitivity of the electron neutrino mass through calorimetric decay spectroscopy of ^{163}Ho.
A room-temperature system targeting readout of MMC detector arrays was successfully demonstrated on prototype hardware. However, readout of large-scale arrays requires specialized hardware in order to offer the full feature set. In this poster contribution, we present the custom software-defined-radio (SDR) system for ECHo-100k consisting of three boards: a data processing board based on a Xilinx ZynqUS+ MPSoC developed in a collaboration between KIT and DESY; a converter board with DACs, ADCs and clock distribution network; and a radio frequency front-end board to translate the signals between the baseband and the microwave domains.

Speed Talks

I am unable/unwilling to give a speedtalk.

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