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## High resolution digitization system for the CROSS experiment

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The signal digitization for CROSS, a bolometric experiment searching for neutrinoless double beta decay at LSC (Canfranc Underground Laboratory), will be based on a custom solution comprised of an analog-to-digital board interfaced to an Altera Cyclone V FPGA module. Each analog-to-digital board hosts 12 channels that allow data digitization up to 25 ksps per channel and an effective resolution of 21 bits at the typical sample rate required by the experiment (5 ksps). The board also allows to digitally select the cut-off frequency of the anti-aliasing filter with 10 bits of resolution from 24 Hz up to 2.5 kHz, as required by pulse-shape discrimination and fast scintillating bolometers. The FPGA is responsible for the synchronization of the analog-to-digital boards and for the data transfer to the storage, using UDP protocol on a standard Ethernet interface. Each FPGA can manage the data coming from 8 boards (96 channels), allowing an excellent scalability. In this contribution we will present a complete overview of the system, a detailed characterization of the system performance, and the results of the first tests with prototypes of the CROSS experiment.

### Less than 5 years of experience since completion of Ph.D

Y

### Student (Ph.D., M.Sc. or B.Sc.)

N

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