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Status of the FAIR Beam Instrumentation MTCA Applications

Tuesday 6 December 2022 14:30 (15 minutes)

As the end of construction of the FAIR accelerator buildings is in sight the MicroTCA-based FAIR beam instrumentation data acquisition (DAQ) systems are ready for installation. Using COTS components or leveraging open hardware with in-house expertise in FPGA programming DAQ solutions for almost all major detector systems now exist in MicroTCA and are already in operation at the existing accelerators. Applications span a wide range often making use of the high channel density and data transfer bandwidth. Beam position and tune measurements over many seconds use an open hardware 250MSa/s FMC ADC with position calculation and data reduction done in the FPGA on the microTCA carrier. Current, pulse shape, and phase measurements with a fast current transformer are performed using a COTS 2.5GSa/s, multi-event FMC ADC/Carrier combination together with an in-house assembled rate divider based on open hardware. These and other applications like continuous scaler readout of 128 channels with 10MHz latching frequency or using MicroTCA as a compact performant readout for GigE cameras will be presented in this overview talk.

Primary author: HOFFMANN, Tobias (Helmholtzzentrum für Schwerionenforschung GSI GmbH)

Presenter: HOFFMANN, Tobias (Helmholtzzentrum für Schwerionenforschung GSI GmbH)

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