

RTM-Modules for waveform digitization.

Thursday 10 December 2015 12:15 (15 minutes)

Digitization of signals is often an important issue of electronics of experiments. Most of the waveform digitizers are built on pipelined ADCs sampling signal of interest. An alternative state of the art solution for the conversion of short signals at GHz rate is based on capacitor arrays. We designed two signal digitizers using those two concepts. The first module is a 16-channel waveform digitizer based on four DRS-4 capacitor arrays. The DRS-4 is able to sample simultaneously 9 signals with a frequency from 700MHz to 5GHz. Every channel of the module is equipped with a comparator for self-triggering. Upon a trigger the signals recorded in the pipelines are converted with 12-bit multichannel ADCs at 30MHz. During digitization the pipelines of another DRS-4 are used for sampling signals to minimize the dead time. One pipeline of each capacitor array is used for producing a sub nanosecond time tag of recorded signals. The second module is a 32-channel ADC board. Each channel of the module is equipped with individually adjustable variable gain amplifiers and 5th order antialiasing filters. Four 8-channel ADCs digitize signals at frequency from 10 to 40MHz. Both modules are built as RTM modules according to MTCA.4 specifications. They follow the Zone-3 pin assignment recommendation from MTCA.4 community at HGF.

Primary author: Mr MENSHIKOV, Alexander (KIT)

Co-authors: Mr TCHERNIAKHOVSKI, Denis (KIT); Mr KURT, Eyuep Atila (KIT); Mr BALZER, Matthias (KIT); Dr KLEIFGES, Matthias (KIT)

Presenter: Mr MENSHIKOV, Alexander (KIT)

Session Classification: Session 6