



**Report of RFTech presentation during
Mixdes conference
(Warsaw, 24-26 May 2012, Poland)**

Title of presentation:
Development of uTCA Hardware for BAM system at
FLASH and XFEL

Presenter:

Samer Bou Habib (PhD student)

Institute of Electronic Systems
Faculty of Electronics and Information Technologies
Warsaw University of Technology
Warsaw, Poland
email: S.Bouhabib@elka.pw.edu.pl



S Bou Habib presented a uTCA modular card system for the xTCA-based BAM system of the FLASH and XFEL accelerators. The system is used to convert optical signals to RF, condition and sample them and send digital data to an FPGA for calculating values needed for the control of the accelerators' beams.

Abstract: This paper describes the design of a uTCA modular card system suited for conversion, sampling and processing of optical pulses. The system consists of a uTCA carrier card along with a double width FPGA Mezzanine Card (FMC) with a changeable optical frontend. The cards were designed for the needs of the BAM system of the FLASH and XFEL accelerators at the DESY facility in Hamburg. The carrier board contains a very powerful FPGA, all required uTCA circuits along with digital interfaces. The FMC card mainly contains four 16-bit fast Analog-to-digital converters (up to 250 MSPS), ADC clock generation and distribution modules, two SFP connectors and a specialized dual RS-485 connection. This paper describes such issues as system organization into universal digital circuits and specialized analog and clock circuits to allow high speed real-time analysis of the properties of the high-bandwidth optical signals of the BAM system and better control of the accelerator beam.

Index Term: BAM, Fast ADC, uTCA, FMC, FLASH, XFEL.

Remarks:

The session was very helpful in learning what is the status of xTCA designs esp. in the combination with the usage of FMC modules.

We acknowledge funding from the European Commission under the FP7 Research Infrastructures project EuCARD, grant agreement no. 227579.