GANDALF – A fast, high resolution Transientrecorder for COMPASS

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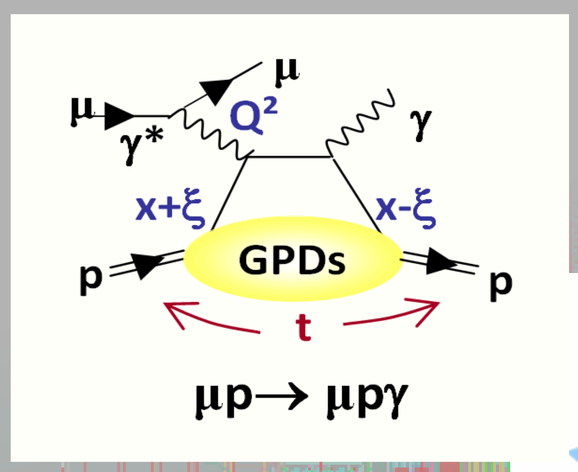
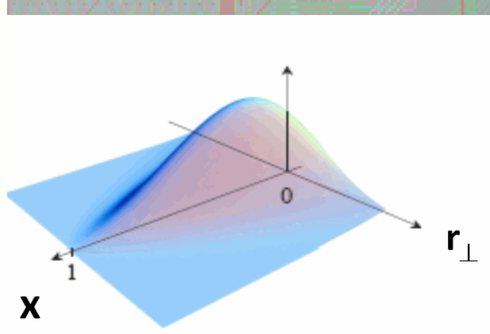
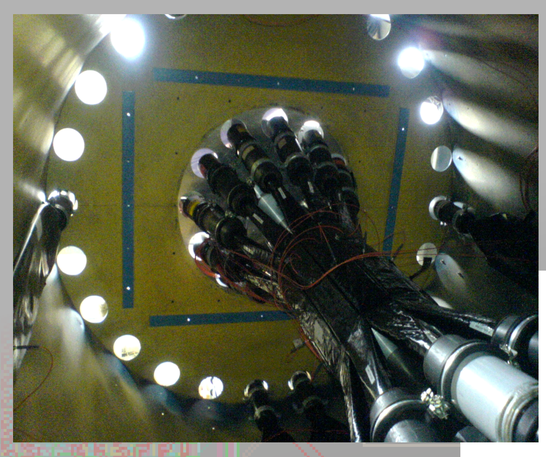
Deep Virtual Compton Scattering



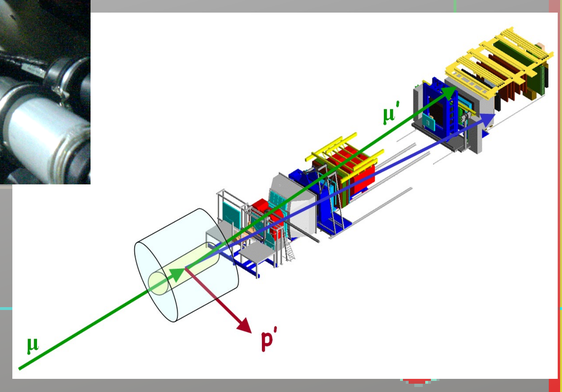
- GPDs:
  A 3D view of the nucleon
- Access by DVCS
- Detect recoil protons for DVCS events



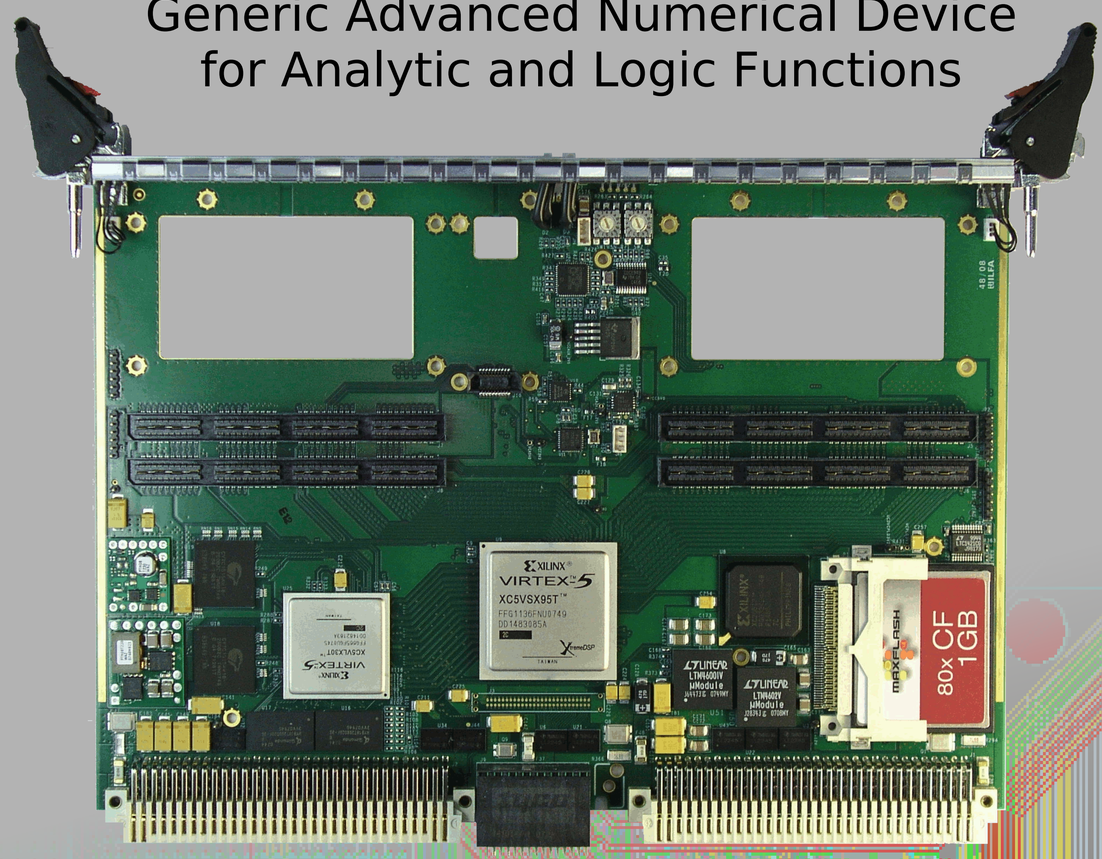
The Recoil Proton Detector at COMPASS



- Readout of 200 channels
- Deadtime free measurement with 50ps resolution
- 12 bit amplitude resolution



Generic Advanced Numerical Device for Analytic and Logic Functions



Analog to Digital Converter

- 500 Msps Pipelined ADC
- 1 Gsps sampling in interleaved mode
- 12 bit or 14 bit resolution compatible

Digital Signal Processing

- Hybrid FPGA with DSP Slices
- Fast calculations of time extraction algorithms
- 50 GigaFLOPS at 500MHz

Full Bandwidth analog input

- $4V_{PP}$ and -2V to $0V_{CM}$ input range
- 500 MHz input bandwidth

High Frequency Clock Synthesizer

- Programmable sampling frequencies up to 500MHz with low jitter (<500fs)
- 180° phase shift for interleaved mode

Aurora High Speed Bus

- Chip to Chip communication
- Up to 30 Gbps data rate

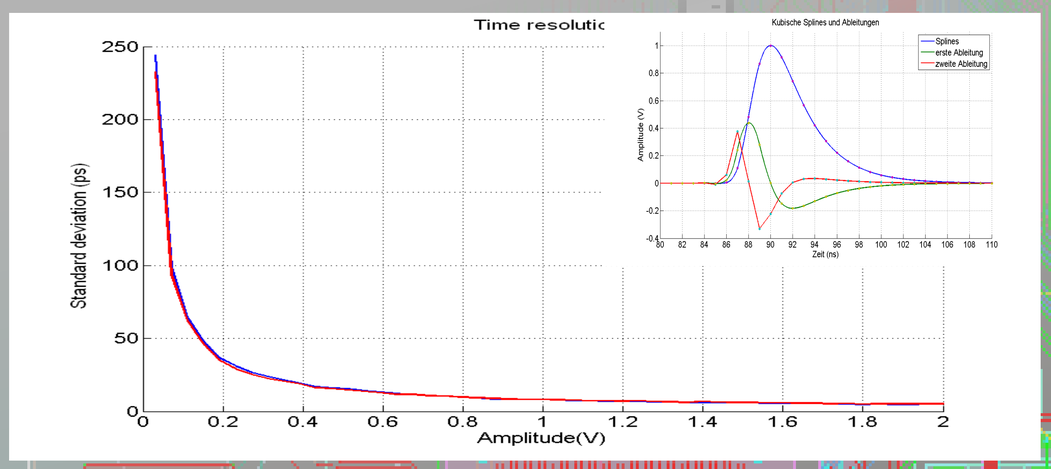
Compact Flash Card

- Standalone Solution and Data Recording
- System Ace: Advanced configuration environment

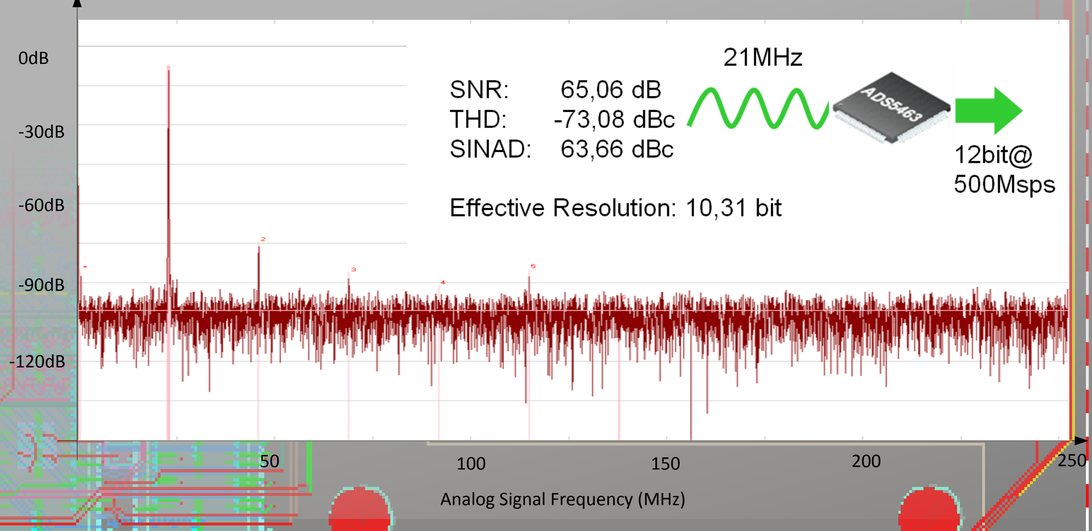
Memory extension

- 144 Mbit QDRII+ dual port at 30 Gbps
- 4 Gbit DDR2 memory for output data at 4Gbps

Time Resolution in large dynamic range



Effective Resolution of Signal Amplitude



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