

HGTD November TestBeam at DESY

- Beam energy is 5 GeV
- Building 27, BeamLine T22
- TB devoted to test ALTIROC1v2
- HPK 3.2 on ALTIROC B2 and HPK 3.2 on ALTIROC B3



Dut Position	1	2	3	4
Oscilloscope	1	2	3	4
	ALTIROC1v2 B3	ALTIROC1v2 B2	LGA35	SIPM

DESY TestBeam Setup

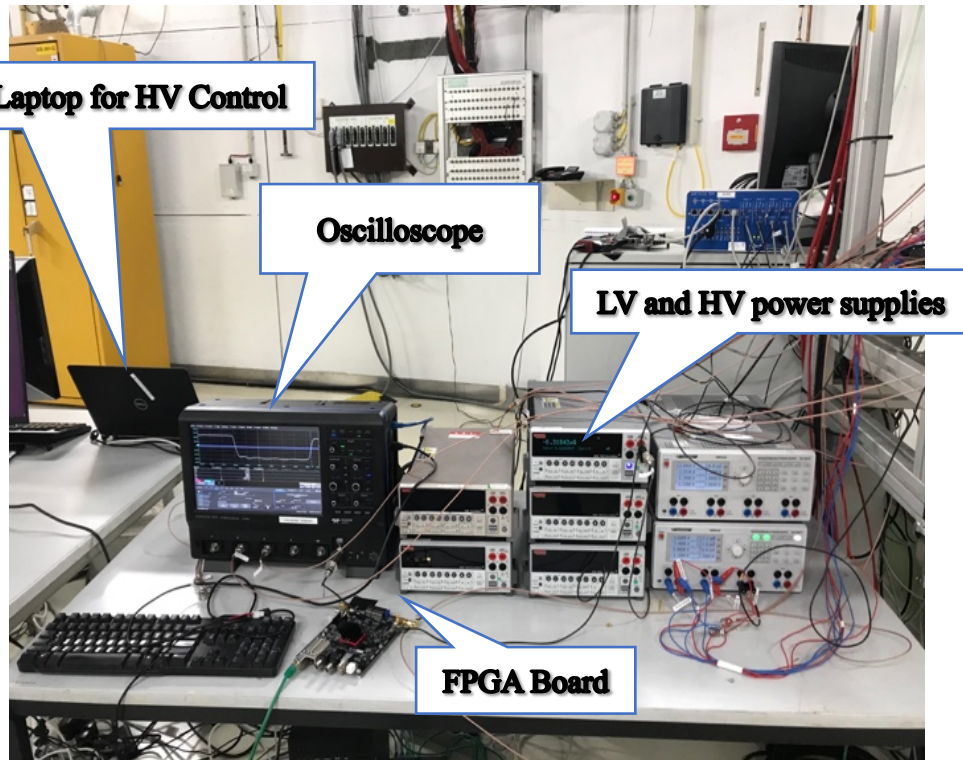


Fig1: High and low voltage power supplies setup

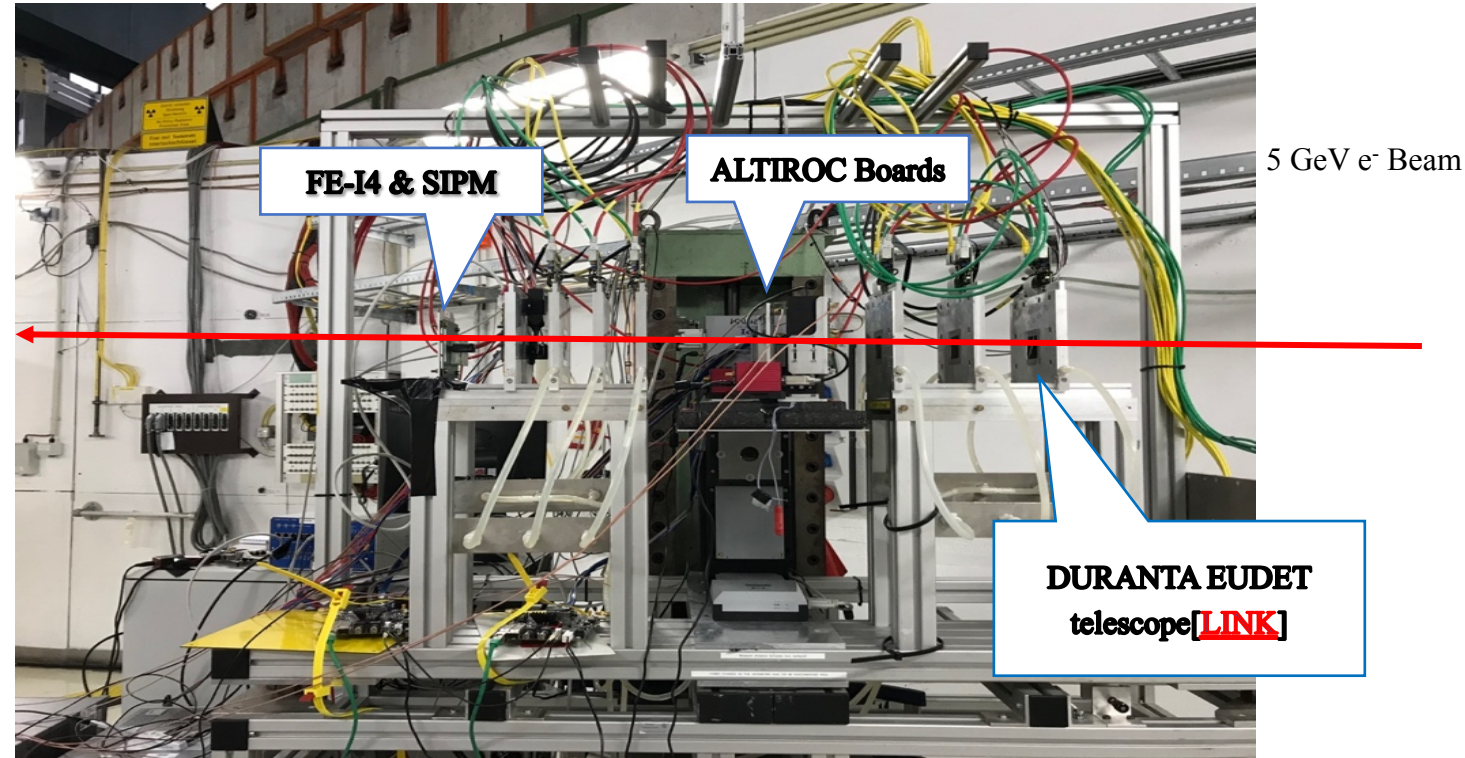


Fig2: Main setup of test beam. Each part is marked with listed equipment

DESY TestBeam Setup

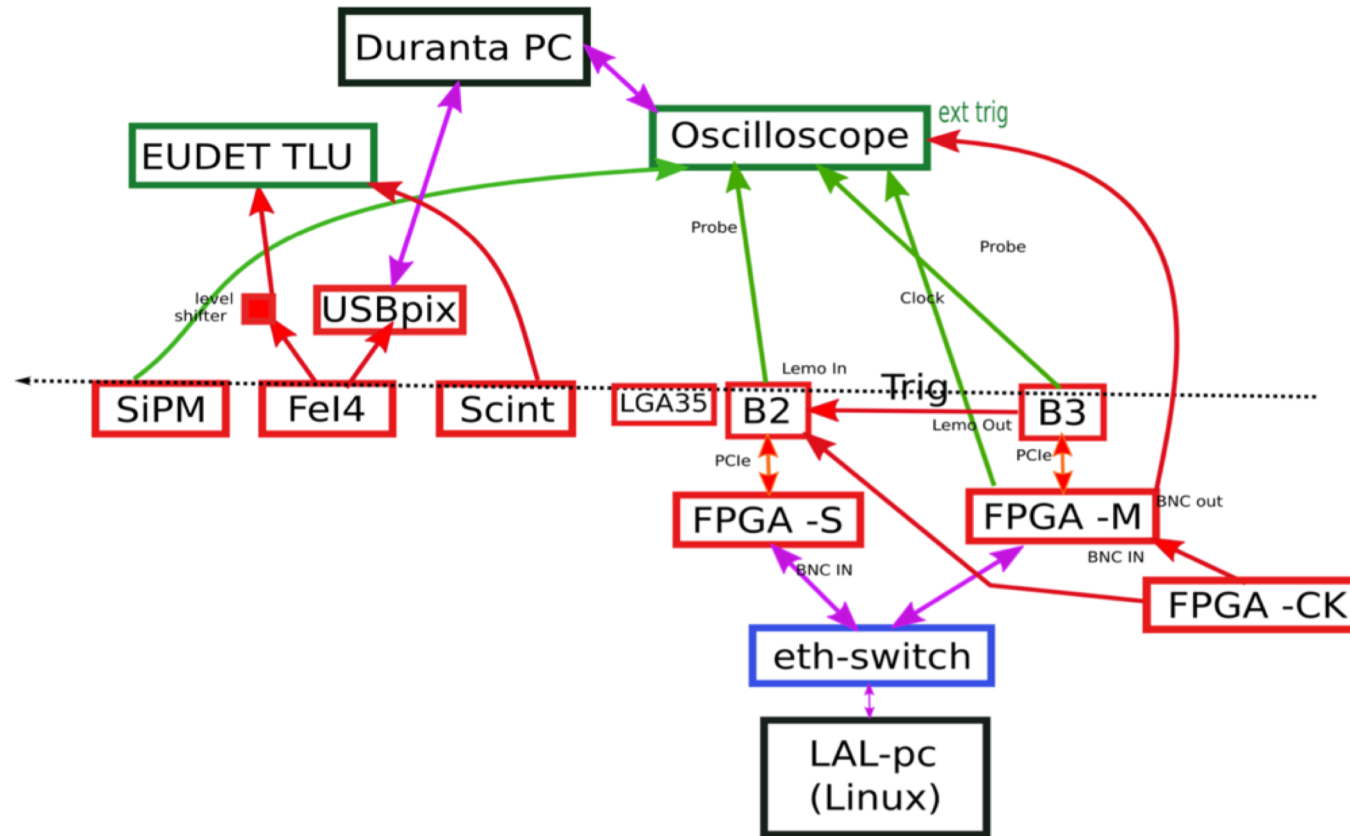


Fig: Testbeam setup flow chart for collecting data during experiment

ALTIROC_V2 and FPGA Board

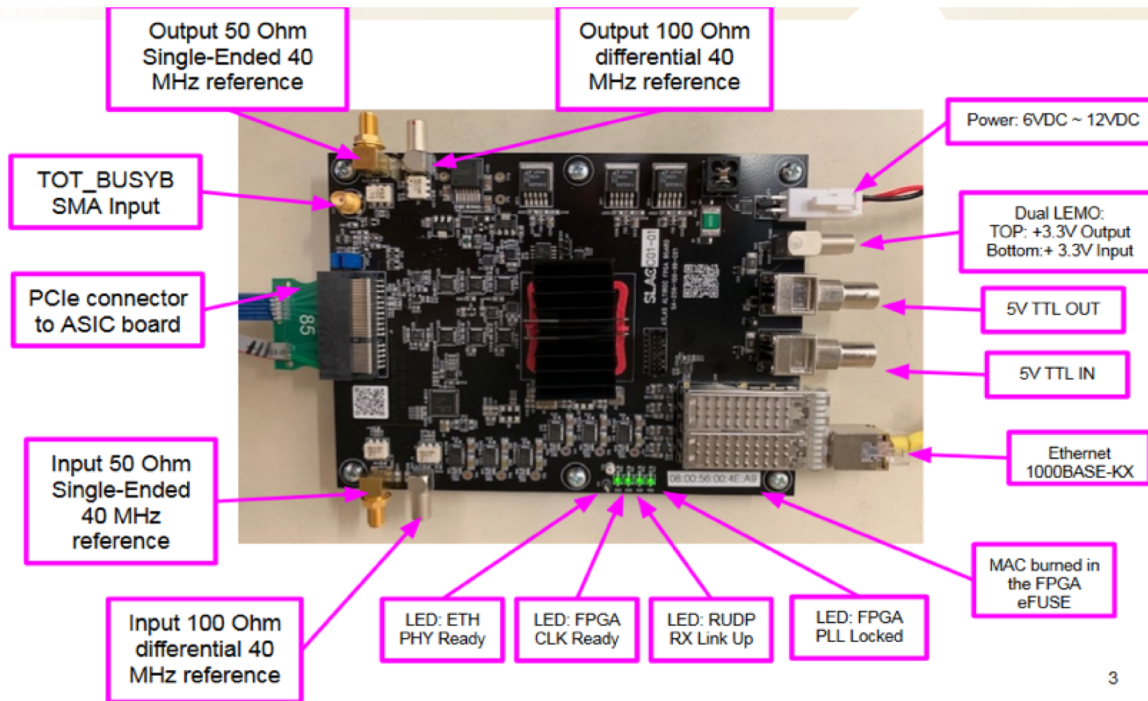


Fig1: [FPGA](#) board described with each port

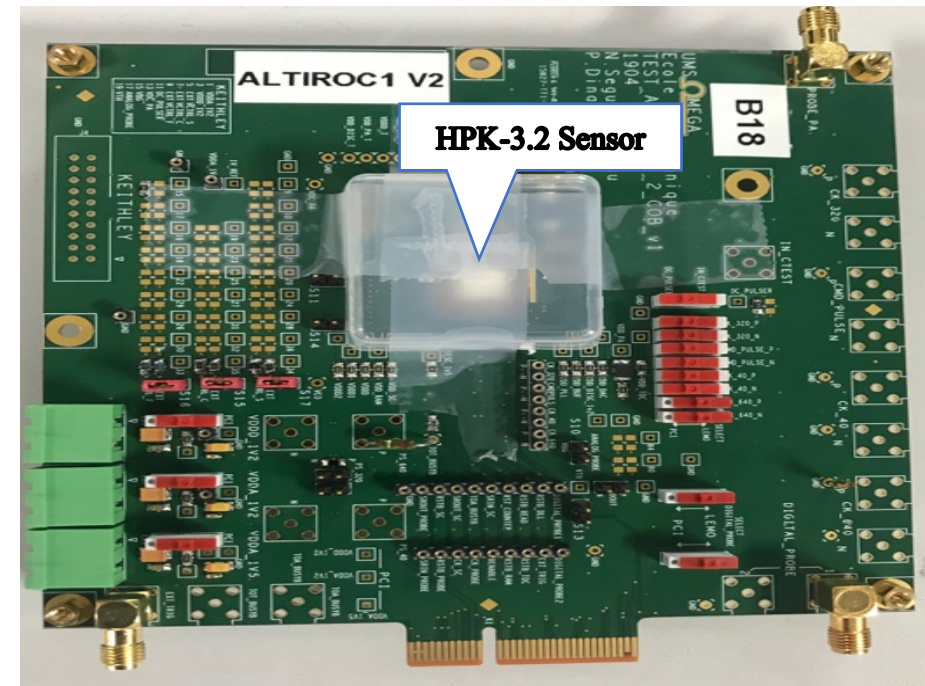
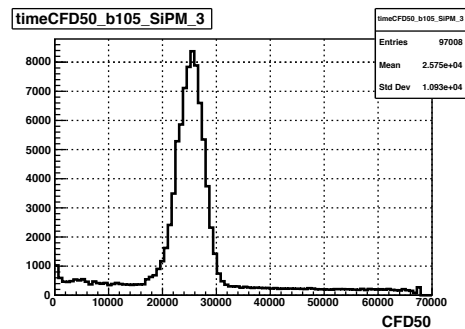
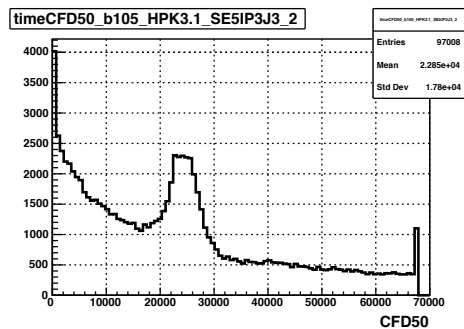
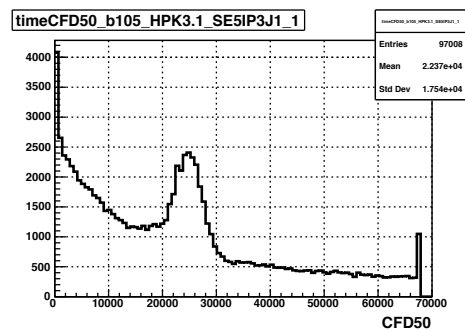
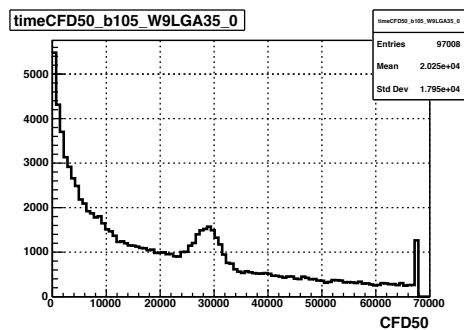


Fig2: [ALTIROCC1_V2](#) board mount HPK-3.2 LGAD sensor

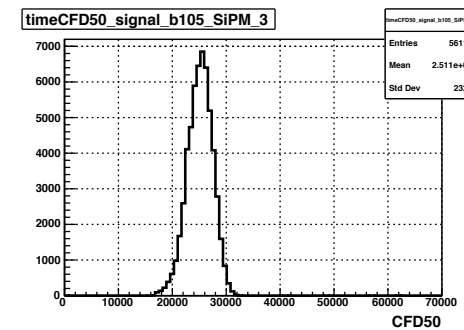
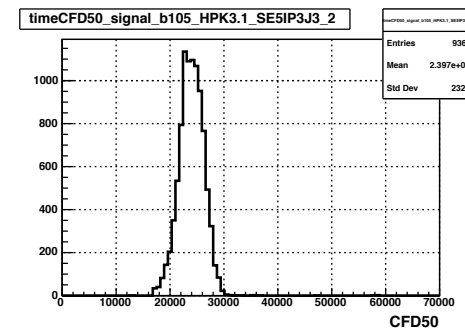
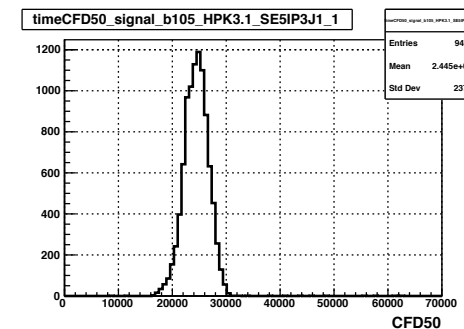
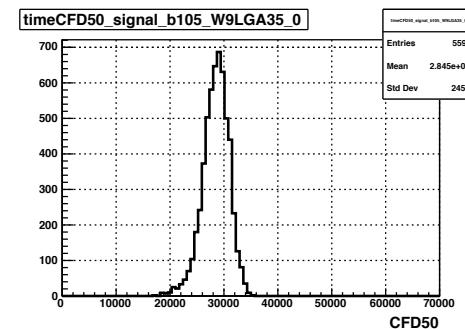
Updates on March-2019 testbeam

Batch 105

CFD timing, applied **pulseHeight>20** cut



pulseHeight>20



Time Resolution

General formula to calculate the time resolution for DUT is given in HGTD testbeam [paper Link](#)

$$\sigma_{HPK3.1-SiPM}^2 = \sigma_{HPK3.1}^2 + \sigma_{SiPM}^2 \quad (a)$$

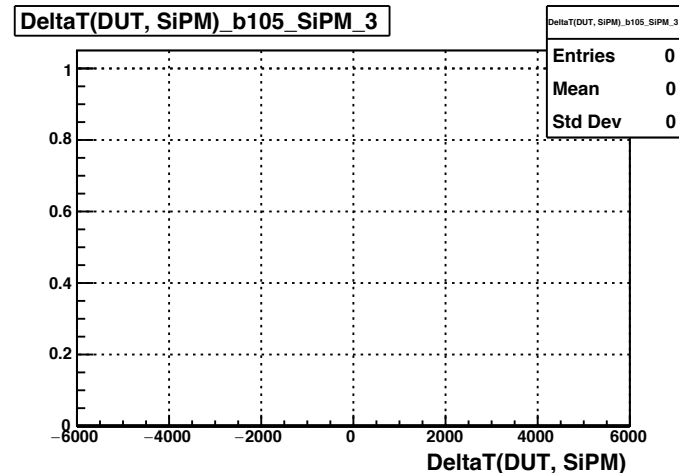
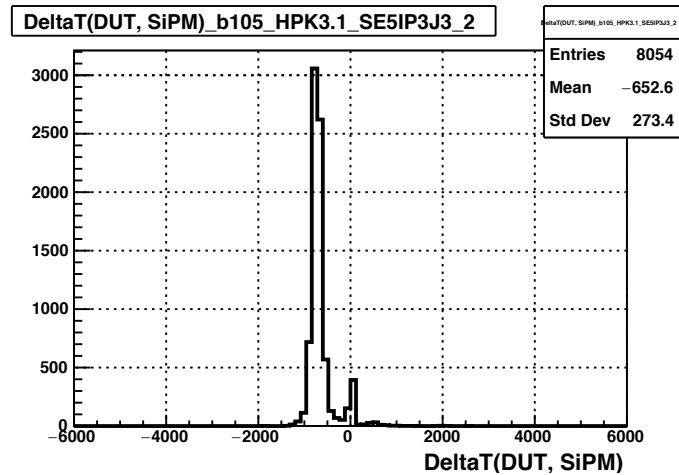
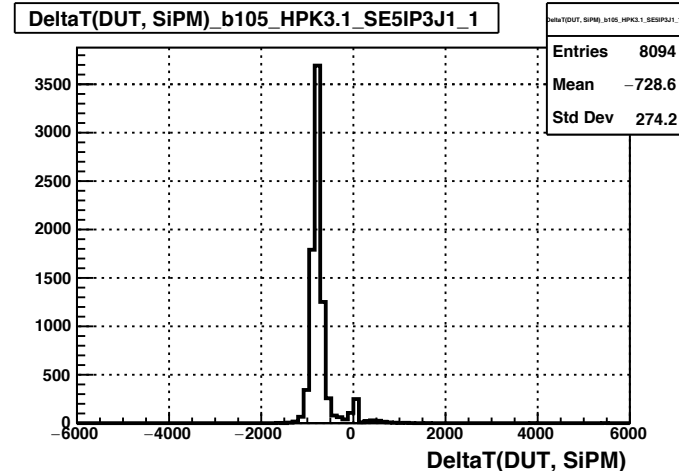
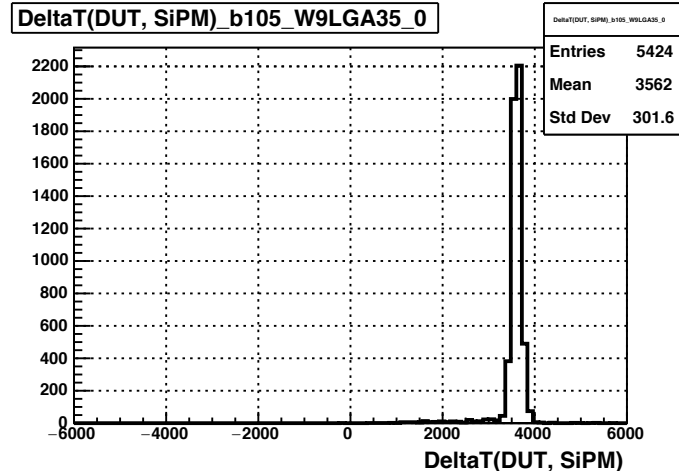
$$\sigma_{HPK3.1-LGA35}^2 = \sigma_{HPK3.1}^2 + \sigma_{LGA35}^2 \quad (b)$$

$$\sigma_{LGA35-SiPM}^2 = \sigma_{LGA35}^2 + \sigma_{SiPM}^2 \quad (c)$$

Solving the above equations we left with

$$\sigma_{HPK3.1}^2 = (\sigma_{HPK3.1-SiPM}^2 + \sigma_{HPK3.1-LGA35}^2 - \sigma_{LGA35-SiPM}^2) / 2$$

DeltaT(SiPM, DUT)



- Next will apply fit and get mean and standard deviation values
- Putting in the equation we will get time resolution