

ÖAW

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SCIENCES



RD50 HV-CMOS Meeting 11.07.2024

Desy-TB results update

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Overview

When: 22.04.-29.4.2024

Where: DESY test beam facility

Measured Sensors

MPW4

- 2x topside biased (HEPHY, Liverpool)
- 2x backside biased (HEPHY, NIKHEF)

Performed Measurements

- High statistic runs
- Threshold Scans
- Bias voltage Scans
- Rotation scans

Beam

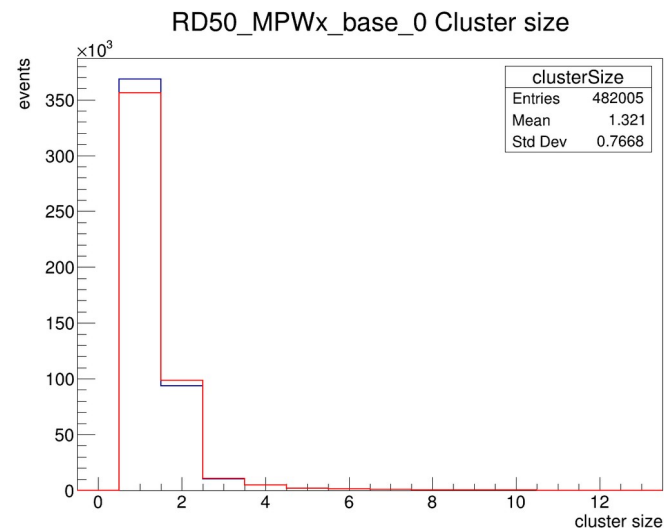
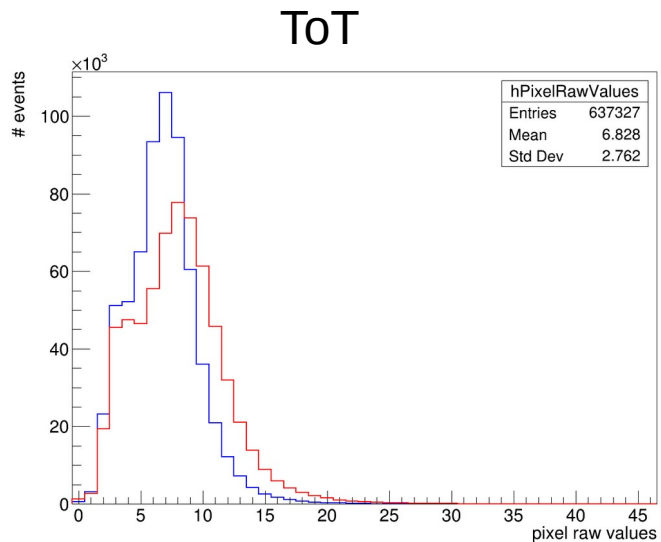
Particles: electrons

Energy: 4.2 GeV

Rate: ~10 kHz

Sample Variation Topside biased

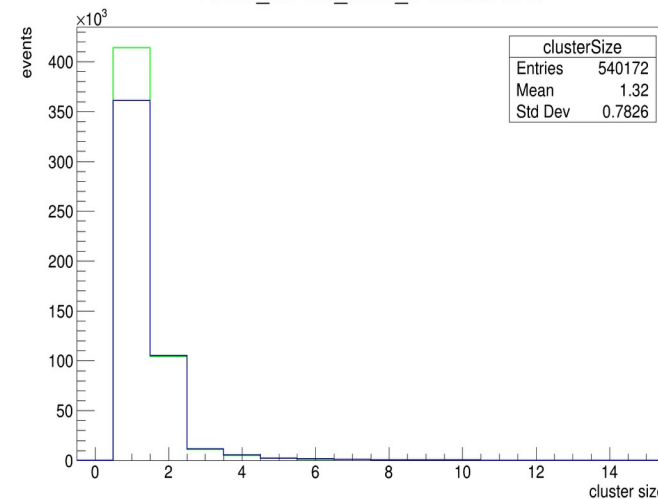
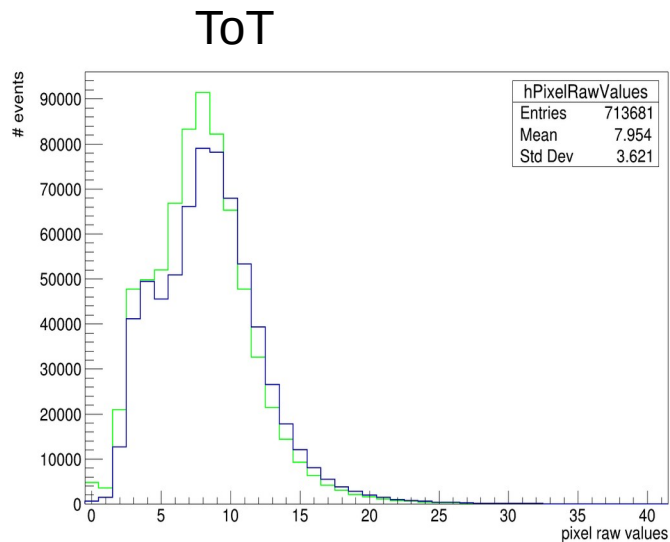
Topside biased	ToT	Cluster Size	V_Bias [V]	Threshold [mV]
HEPHY	6.9	1.32	190	20
HEPHY	6.8	1.27	190	35
Liverpool	8.1	1.35	190	40



Sample Variation Backside biased

Backside biased	ToT	Cluster Size	V_Bias [V]	Threshold [mV]
HEPHY	8.5	1.37	190	40
NIKHEF	8.0	1.32	200	40

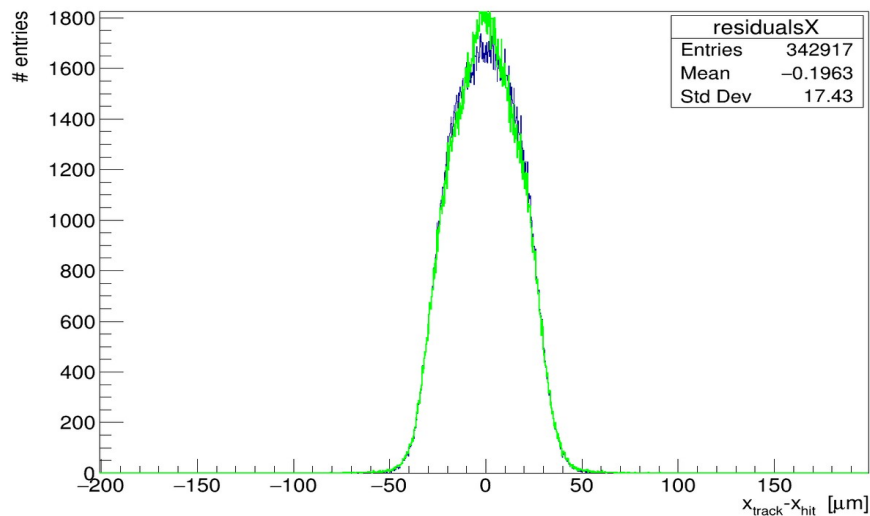
Problems with run with 190 V
RD50_MPWx_base_0 Cluster size



Impact of Charge Weighting

Charge Weighting: on/off

Residual in local X

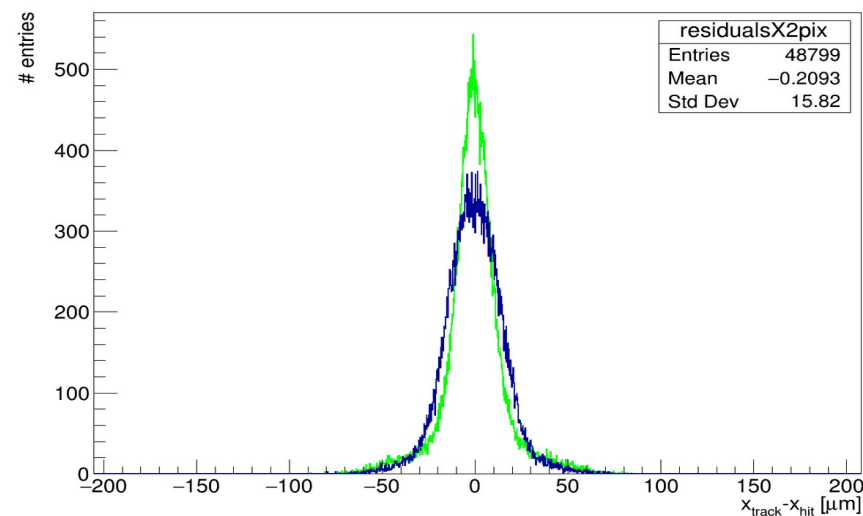


Spatial Resolution

With Charge Weighting: 17.43 μm

Without Charge Weighting: 17.41 μm

Residual for 2-pixel clusters in local X



Spatial resolution 2Px

With Charge Weighting: 15.47 μm

Without Charge Weighting: 15.82 μm