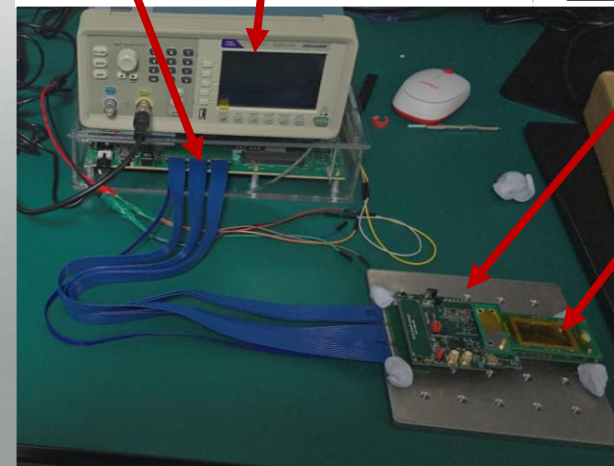
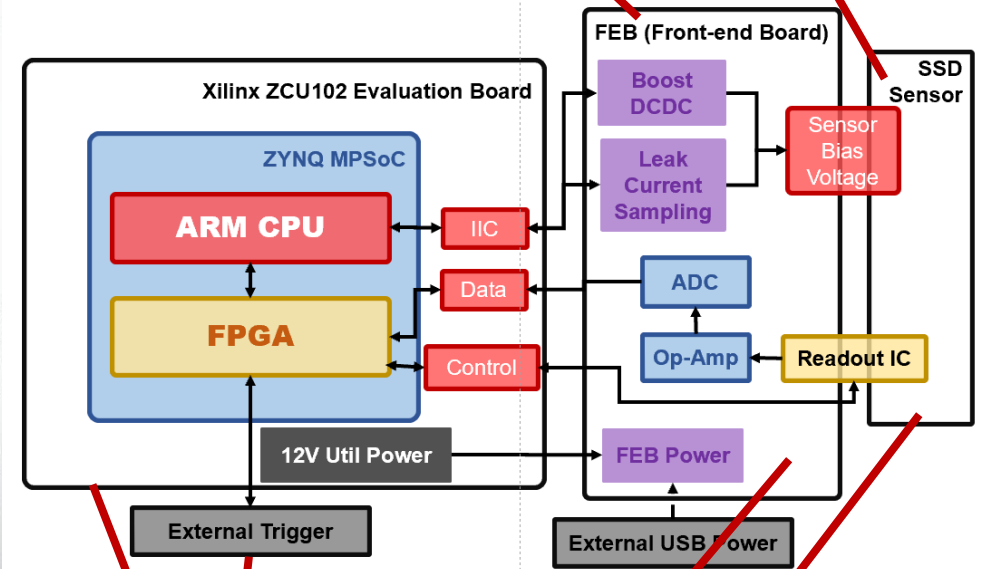
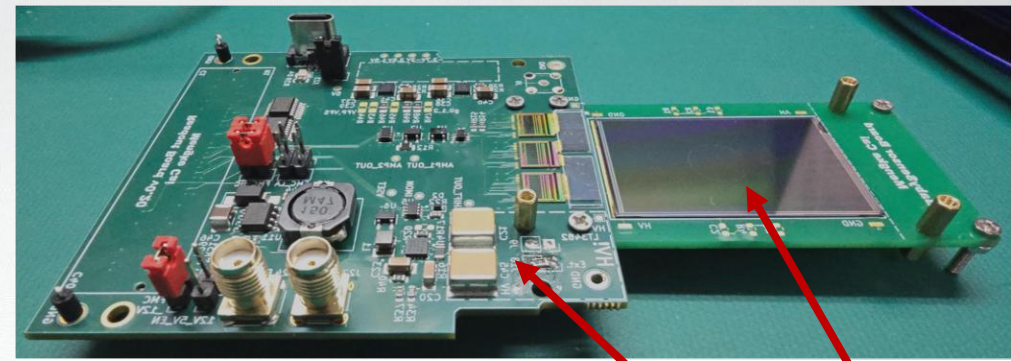


A mini-SSD detector for Inner Tracker's beam tests

Mengke Cai for HVCMOS team

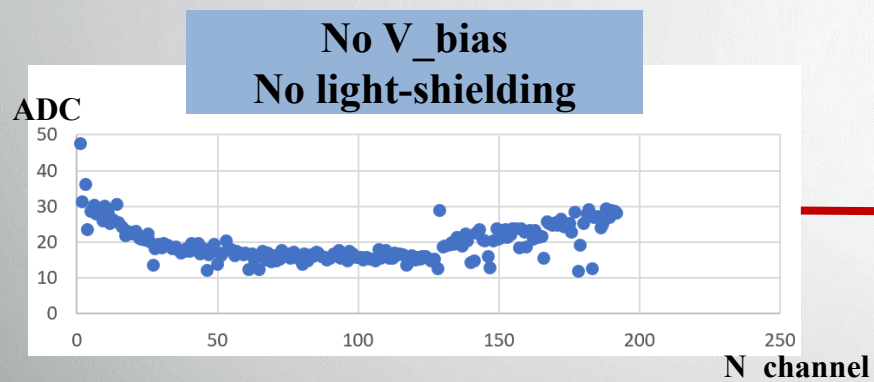
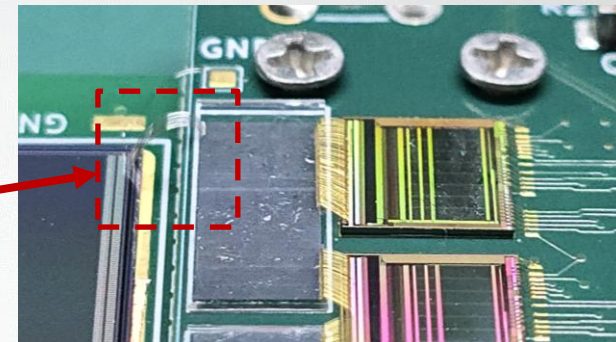
System architecture

- Compact front-end circuit
 - ROIC, 14-bit ADC, FE powering, HV, leak current monitoring
 - VITA 57.1 FMC compatible
- HPK 24 x 40 mm² p⁺-in-n mini-SSD
 - ~ 120 um pitch (60 for both-end readout)
 - 192 channels (384)
- Customized DAQ on Xilinx ZCU102 evaluation board
 - Access remotely with ethernet
 - Process trigger at ~ kHz

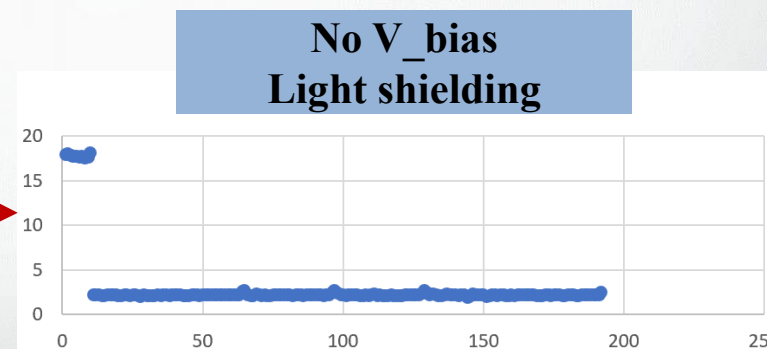


Calibration results

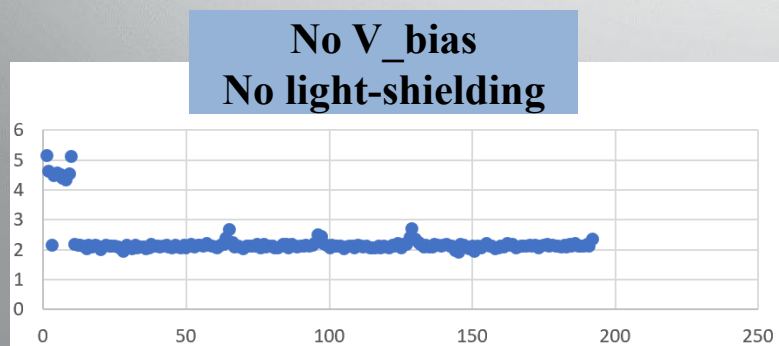
- Calibration with only first 10 channels wire-bonded
 - **RMS noise** for ADC reading



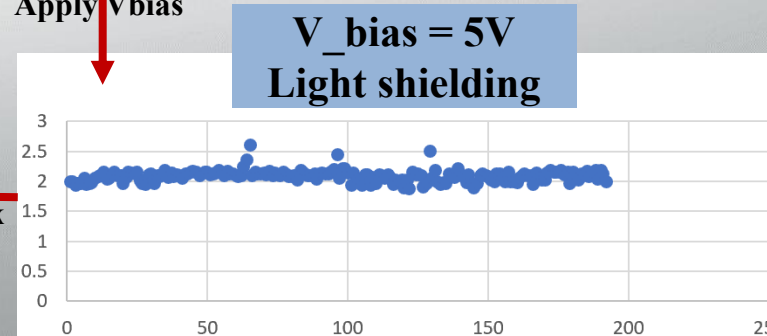
Put in
black box



Apply V_{bias}

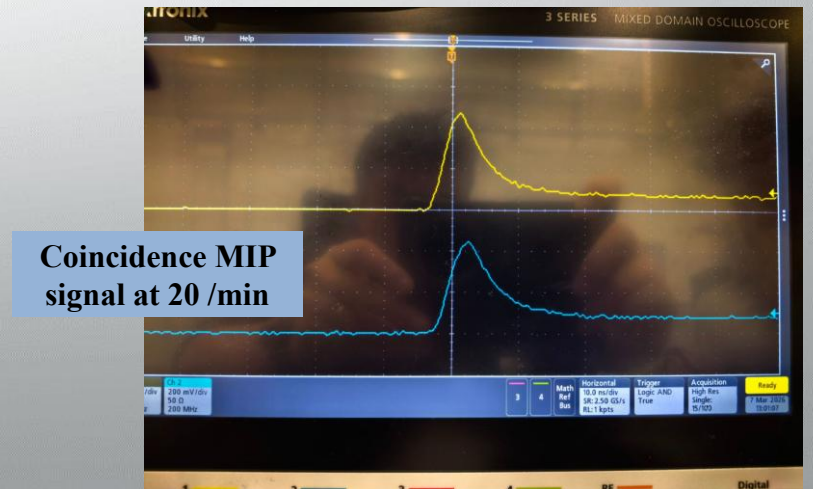
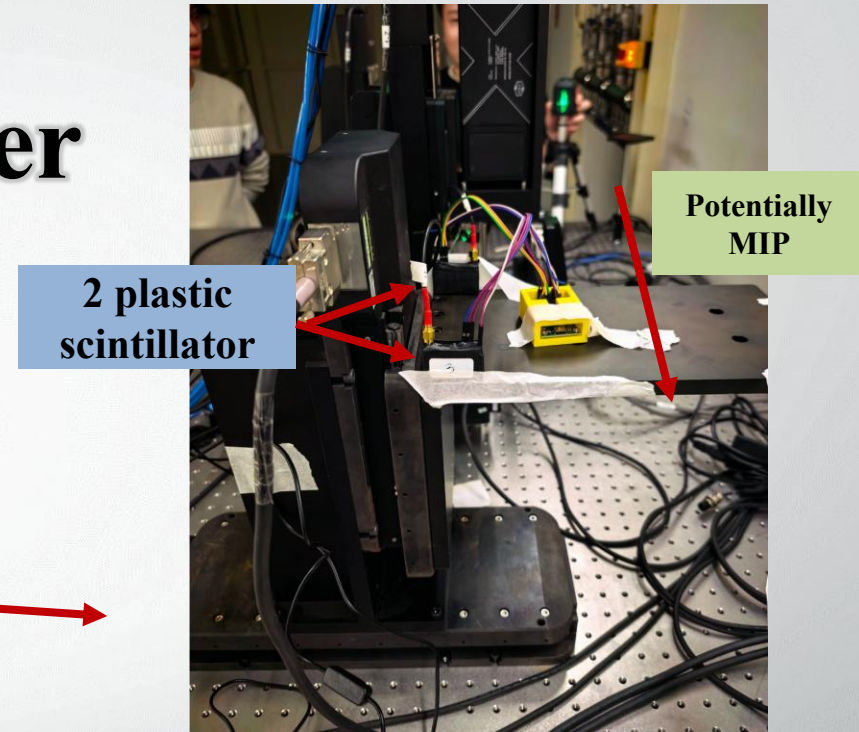


Remove V_{bias}
Remove black box



Telescope for the Inner Tracker

- Receive trigger from plastic scintillator -> Beam monitor
 - Cosmic ray / laser
 - Beam tests this year
 - Recently at the HEPS, Beijing
- Telescope development
 - 1 ZCU102 to multiple detectors – electronical / mechanical design
 - DAQ – Compatibility with Caribou DAQ
 - DAQ for HVCMOS



Backup