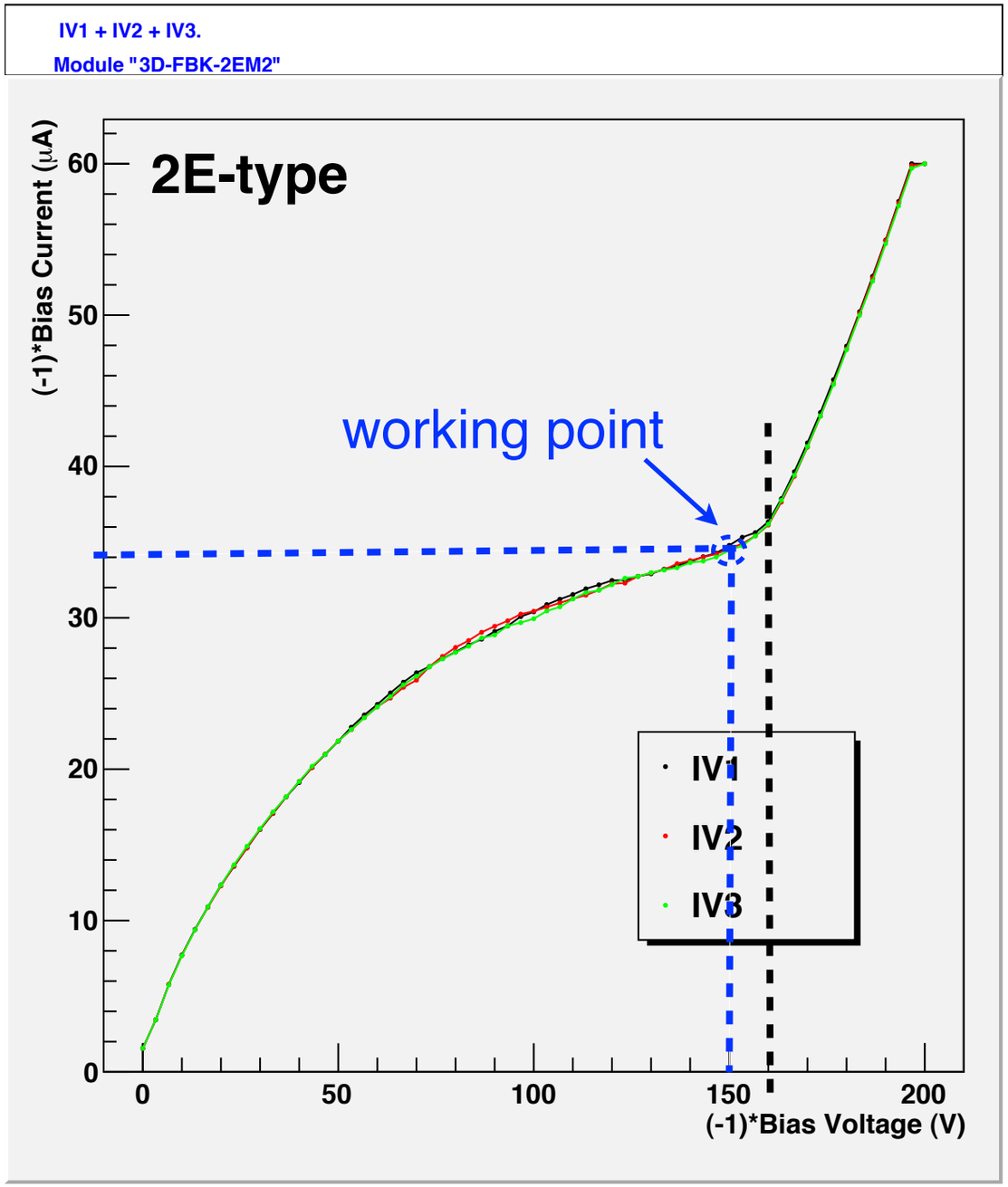
Preliminary results with irradiated FBK devices

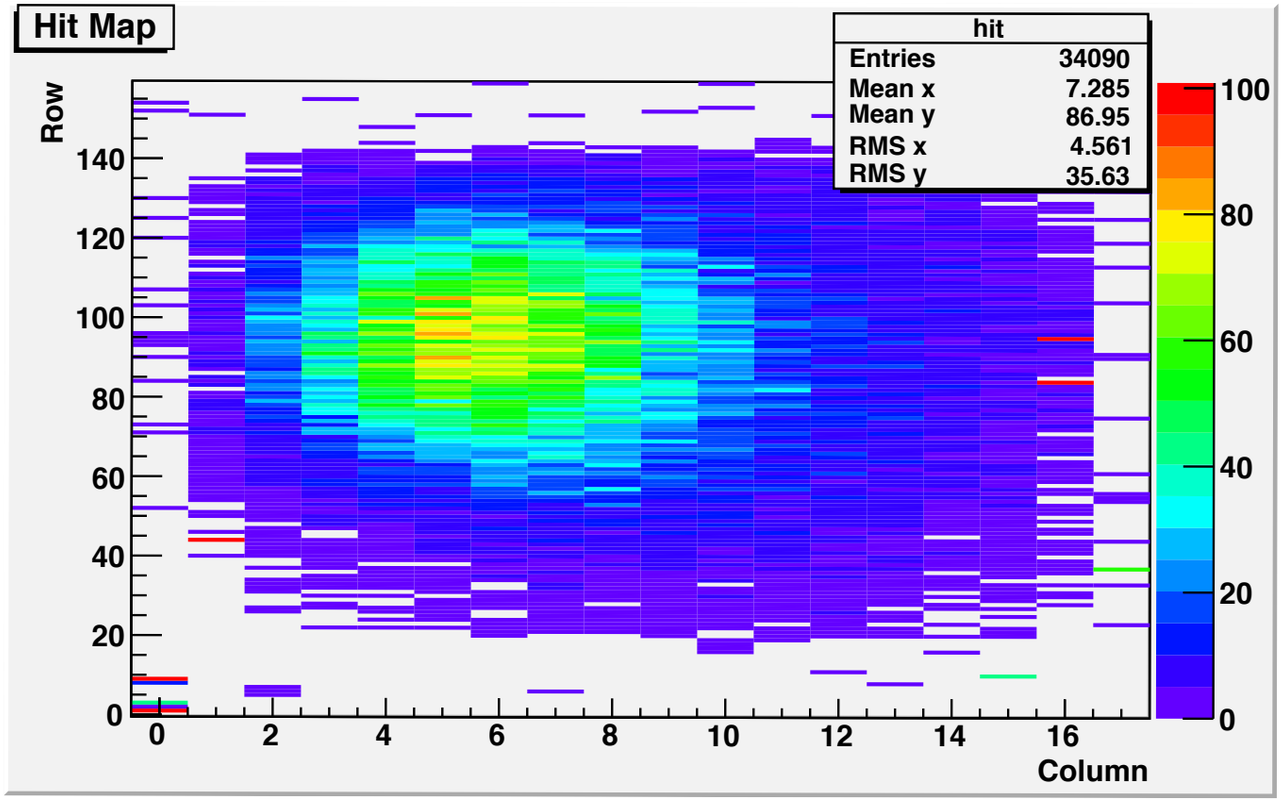
Alessandro La Rosa

Overview

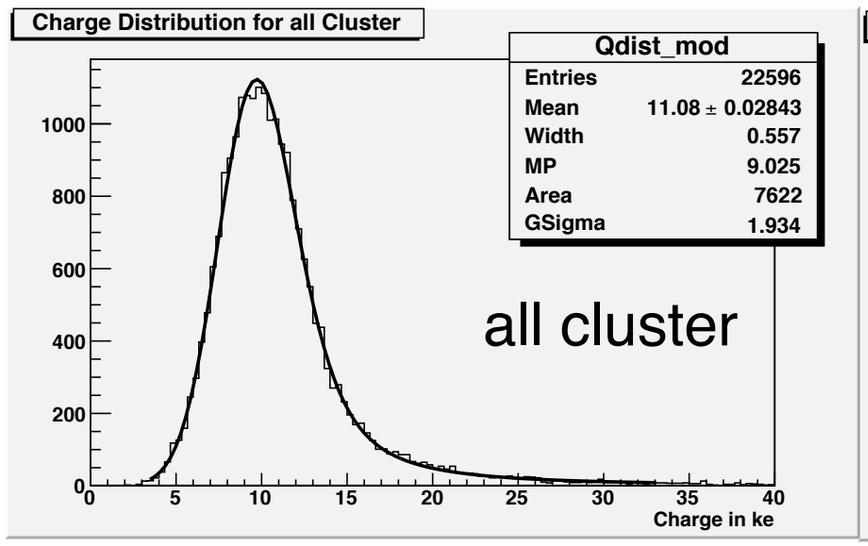
- Two devices (2E and 4E from first batch) have been recently irradiated at CERN PS with 24GeV proton beam
- Requested fluence $3x10^{15}$ p/cm^2
- Achieved fluence $2.8x10^{15}$ p/cm^2 (about $1.74x10^{15}$ n_{eq}/cm^2)
- 2E-type almost full characterized
  - IV at -20C
    - breakdown at ~160V
    - working point: I_{leak}=34uA at 150V
  - Noise vs bias voltages
    - <N>=175e at -150V
  - Gamma source test at diff HV
    - on-going
  - Beta source test at diff HV
    - MPV= 10-13ke at 150V
- 4E-type characterization still on-going

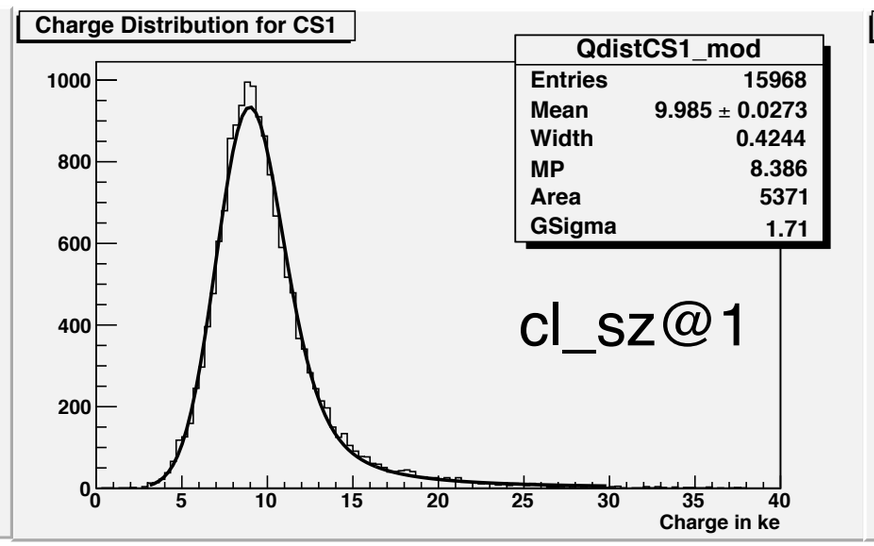


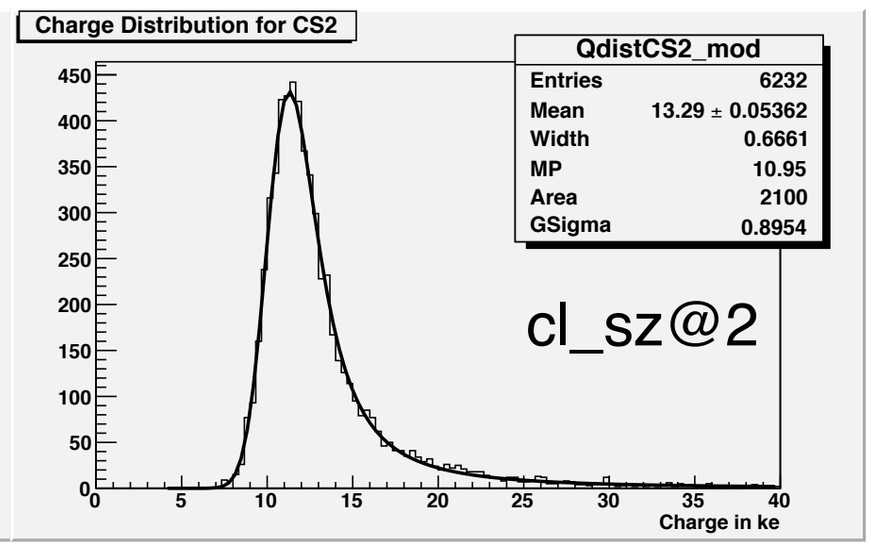
External-trigger operation with Sr^{90} source



- DUT irradiated at 1.74×10^{15} n_{eq}/cm^2
- sensors: 200um thick
- Temperature: -20C
- HV=150V
- FE tuned with 60ToT at 20ke
- about 10-20% signal lost w.r.t unirradiated device







Measurements performed by C. Gallrapp

Collected charge versus fluences

- Measurement performed at CERN with different FBK irradiated sensors
  - Sr90 source test (external triggered)
  - Five different sensors under test (irradiated at CERN, Karlsruhe and Ljubljana)
  - HV chosen in agreement with the best sensor-working-point
  - MPV selected from CL_SZ at 1 plots