RT3 - Proton testing

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Specific ... emerging issues

- Practical issues
  - Activation of samples
  - Shielding of nearby electronics
  - Radioprotection/safety
- TiD degradation of exposed devices => limited fluence
  - Sample size to be tested ("hard" devices)
  - Impacts on the measured sensitivity ("soft" devices)

Emerging...

- Angular dependence

Open points

- Angular dependence
  - 2nd order effect?
  - Need for recommandations?
  - DDD? (Y.F. Zhao TNS1997 : MQW laser diode)
- Usage of degraded/tuned beams
- Energy range

Future needs?

Low flux

High flux (dose deposition)

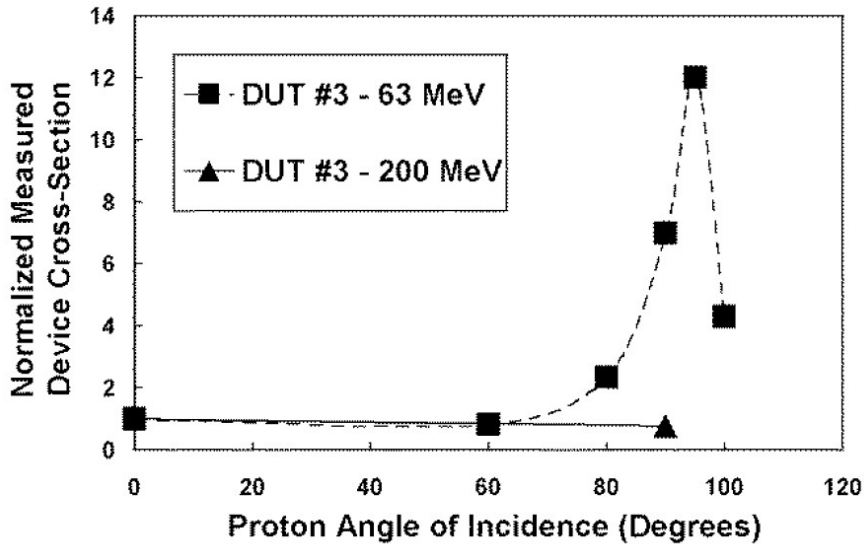
Representative spectrum (DDD) ...etc...

Angular dependence

Devices sensitive to

- both indirect/direct ionisation (ex: SET in optocouplers)
- anisotropic distribution of recoils (ex: SEU/MBU due to Nuclear reaction spallation in in devices with mean>large Qc, large aspect ratio)

Energy dependent

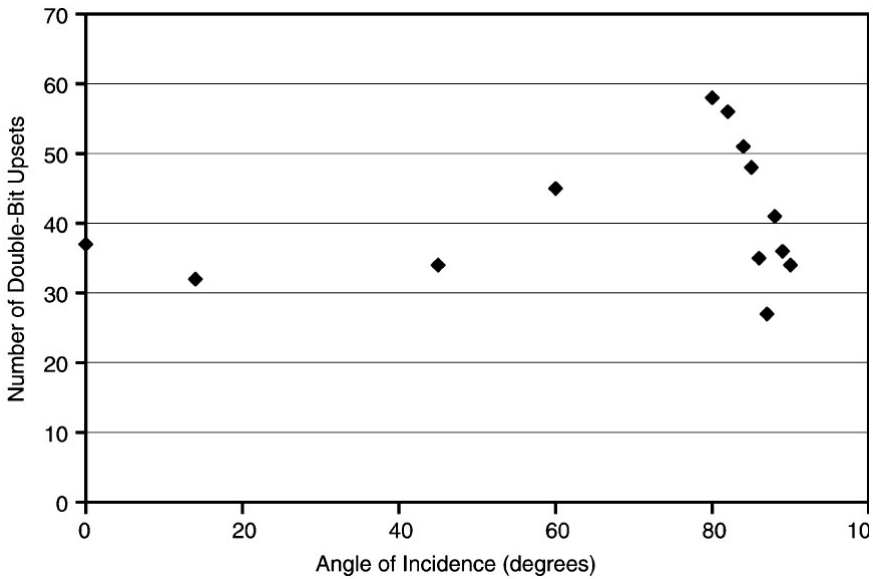


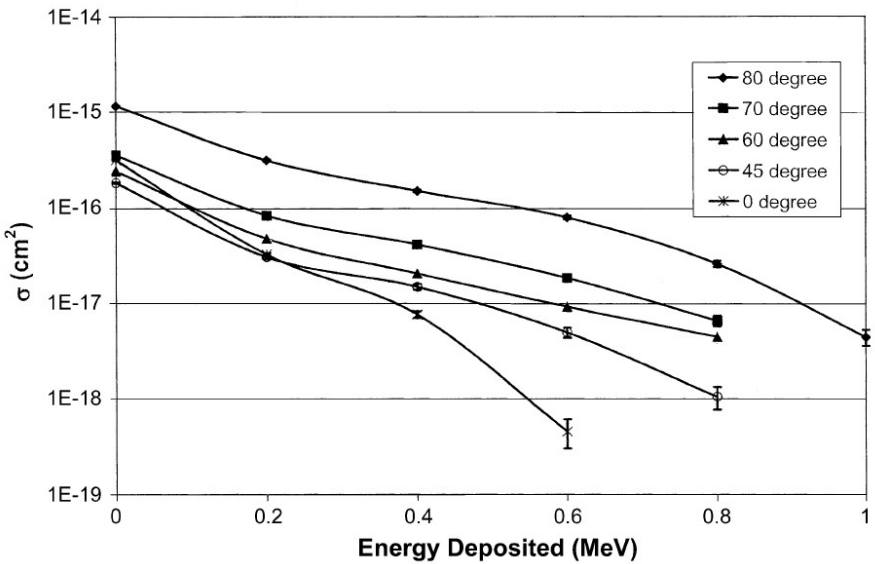
(R.A. Reed TNS2002)

PE9301 prescaler

Angular dependence (MBU)

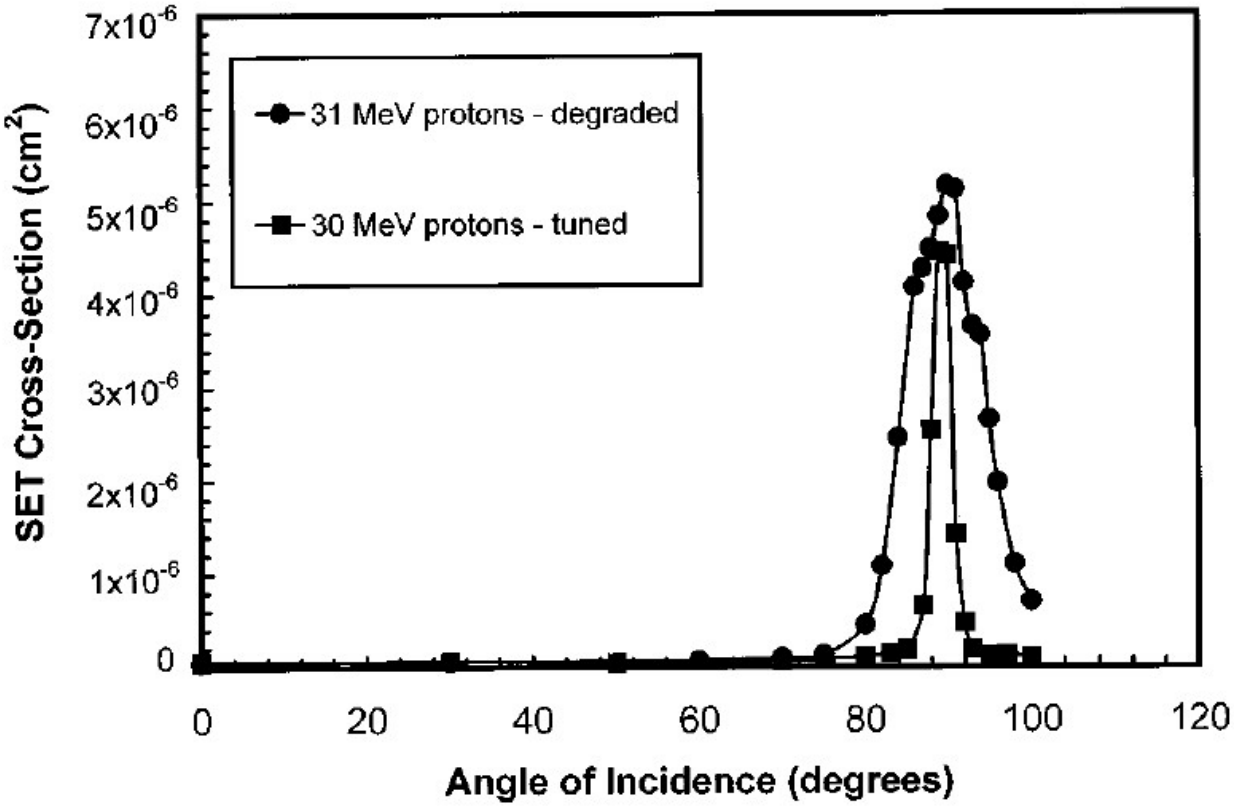
NEC 16M DRAM (S. Buchner TNS2004)





Angular dependence (SETs)

Agilent optocoupler (R.A. Reed TNS2001)



Saturation of σ(E)