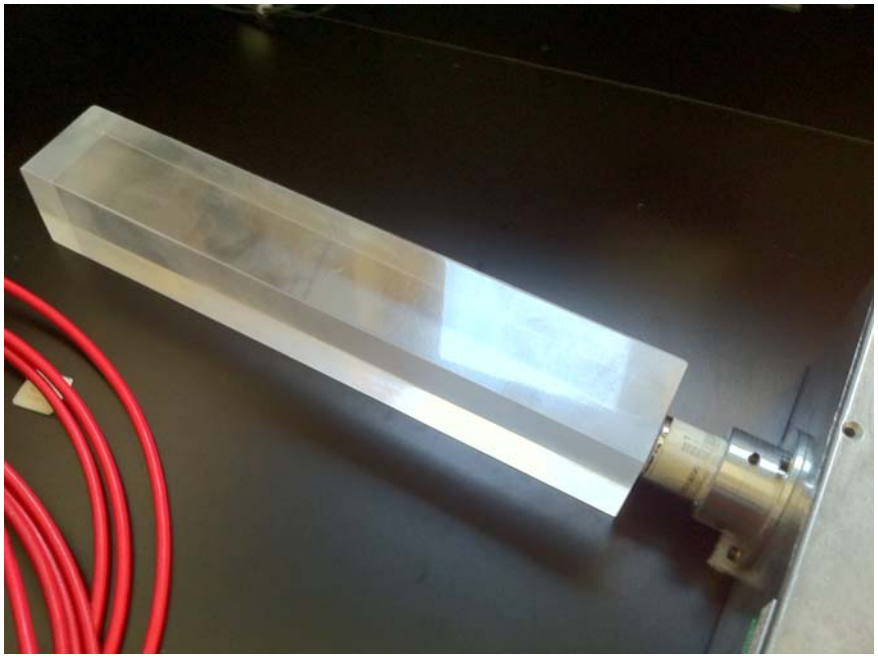
INFN
Istituto Nazionale
di Fisica Nucleare

CsI(pure) mesurement

Alessandro Rossi

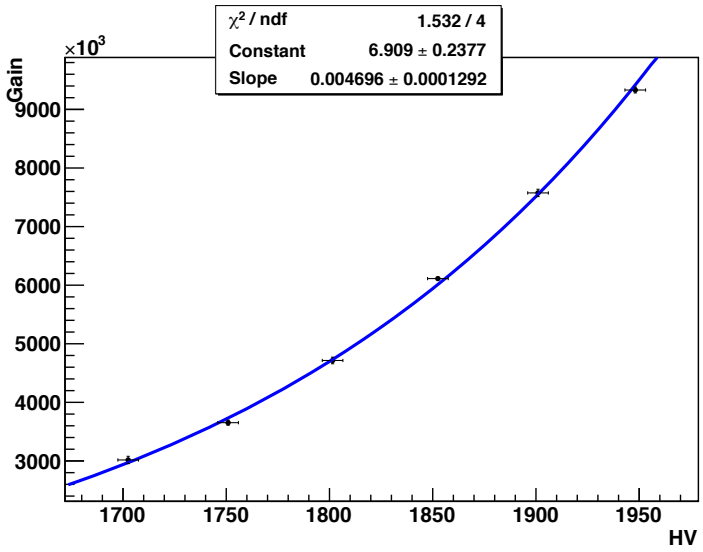
Set-Up

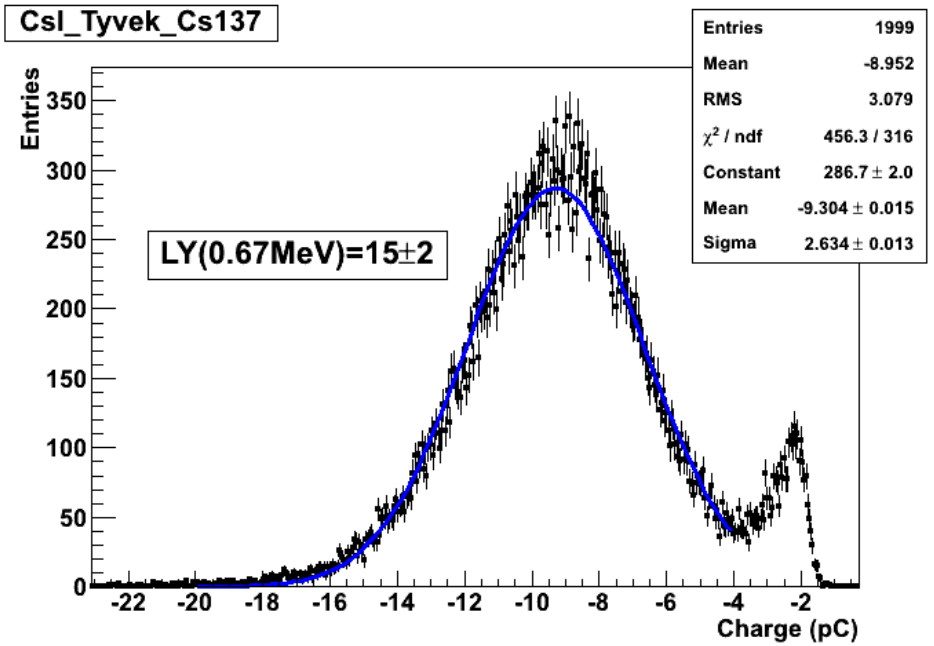


Crystal dimension:
5x5x30 cm^3

- No way to see rad. sources with VPT
  - To low gain (10x)
- Measurements performed with a standard PMT
  - Photonis XP2266b
- No grease on PMT surface
- Crystal wrapped with tyvek
- Source: Cs137 (γ 0.667KeV)

Measurement result

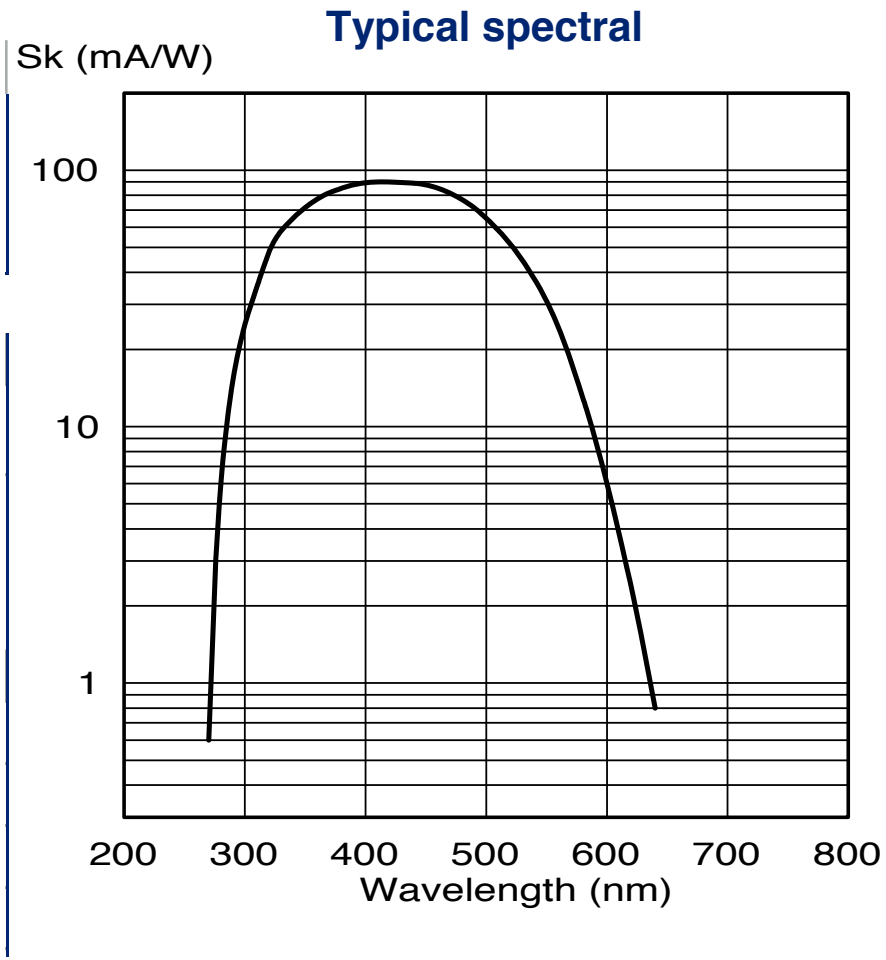




- Same PMT used for previous LYSO measurements
- Results : 15pe/MeV
- LYSO in the same condition ~1000pe/MeV

Quantum Efficiency

- CsI peak emission : 315nm
- LYSO peak emission: 420nm
- PMT QE:
  - CsI : ~8%
  - LYSO : ~25%
- Taking into account the QE
  - LY(CsI)= 192ph/MeV
  - LY(LYSO)= 4000ph/MeV
  - CsI/LYSO ~ 4.8%
- PMT surface ~ 20.4cm^2
  - LYSO surface 4 cm^2
  - CsI surface 25 cm^2



Conclusion

- Few electron seen with a standard photocathode at 315nm
- Measures very similar to the PDG value:
  - CsI light output w.r.t. NaI ~ 4.7% (PDG)
  - LYSO light output w.r.t. NaI ~ 83% (PDG)
  - CsI/LYSO ratio ~ 4.7/83 ~ 5.6% (PDG)
    - Taking into account the PMT and crystal surface: CsI LY reduced by a factor 20.4/25~0.82
    - CsI/LYSO ratio ~ 4.6% (PDG)
  - Measured CsI/LYSO ratio : 4.8%
- More studies on uniformity, decay time etc. will be performed soon
- By the end of September also measurement with Hamamatsu Photopentode