

NEXT Collaboration



CEA-Saclay



U. de Coimbra



JINR



IFAE, CIEMAT,
U. Santiago, IFIC,
U. Politecnica Valencia,
U. Zaragoza



LBNL,
Texas A&M

- Spain provides:
 - Most collaborators
 - Most of secured funding (~5 M EUR)
 - Host laboratory (Canfranc)

- Smaller but key contributions from experienced groups in other countries:
 - TPC detector design
 - Gaseous Xe detectors
 - Tracking with MicroMegs
 - Xe supply and enrichment

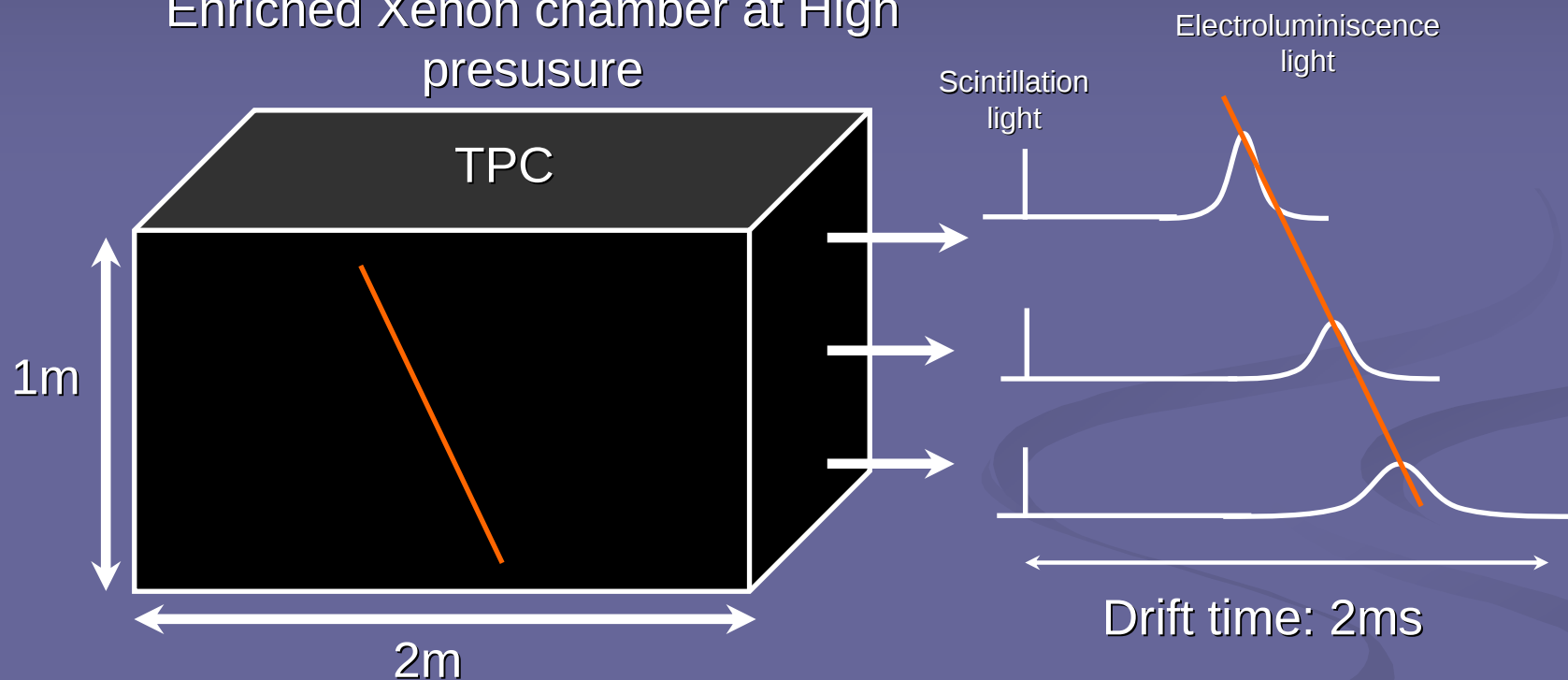
At IFIC:

M. Ball, J. Bayarri, S. Carcel, A. Cervera, J. Díaz, A. Gil, J. J. Gomez-Cadenas, A. Kira, D. Lorca, J. Martn-Albo, F. Monrabal, J. Muñoz-Vidal, J. Pérez, L. Serra, M. Sorel, N. Yahlali,

NEXT

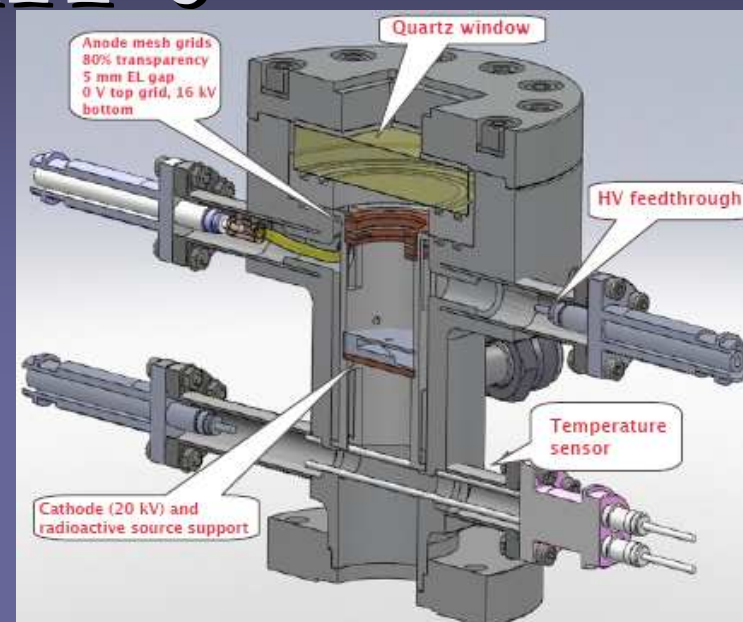
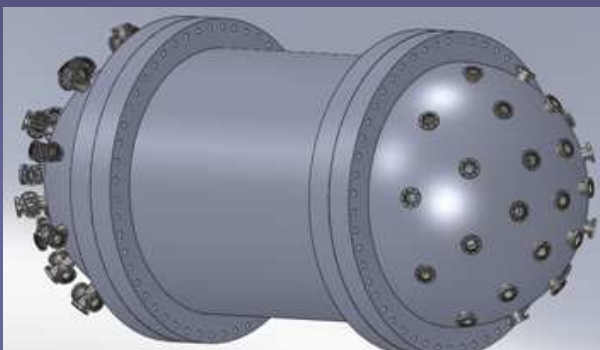
- Neutrino Experiment with a Xenon TPC
 - Double beta decay experiment

Enriched Xenon chamber at High pressure

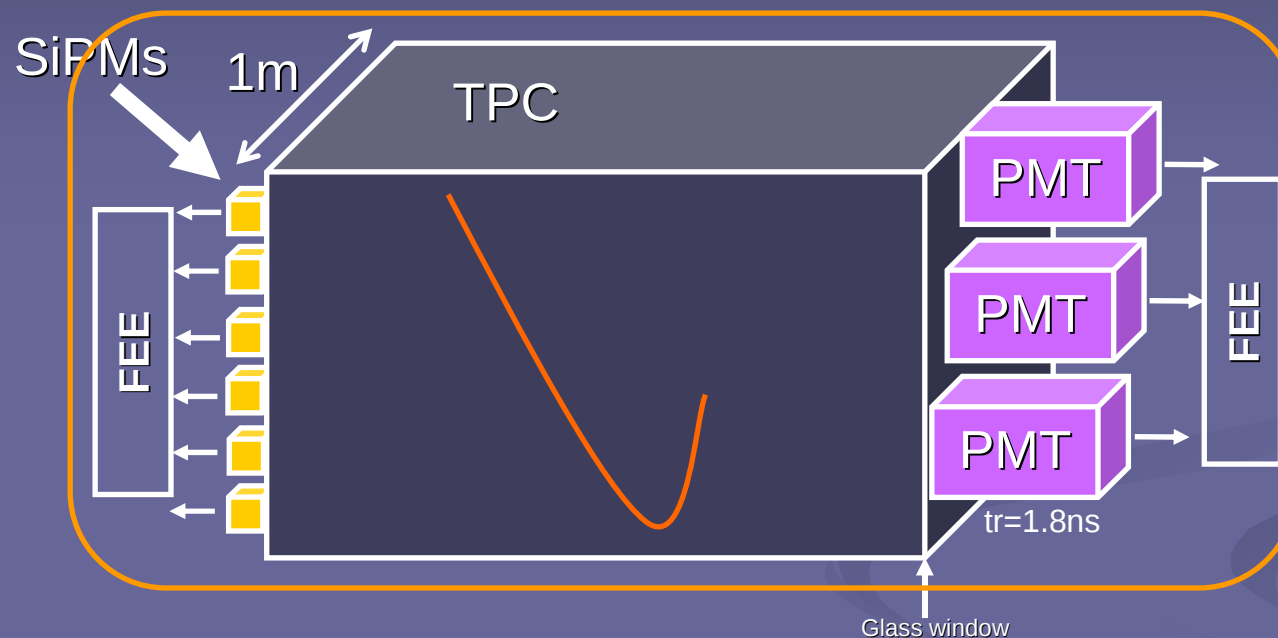


- Requires:
 - Measurement of energy
 - Trace reconstruction (tracking)

NEXT 0



Specifications



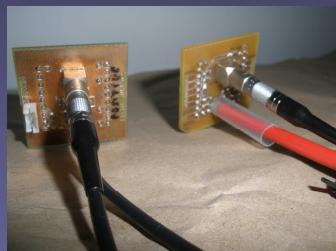
SiPMs ~10K ch

- Tracking
- Requirements:
 - $1\mu\text{s}$ (1mm)
 - Energy resolution of about 10%
 - Some pile up rejection for curves

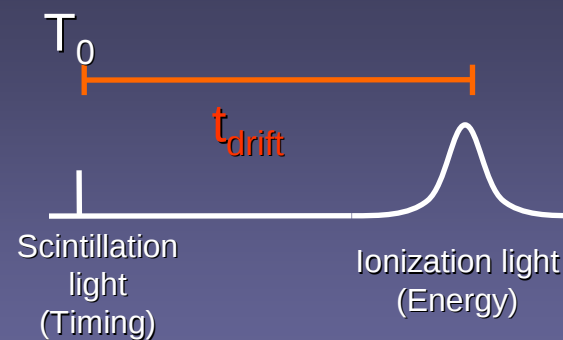
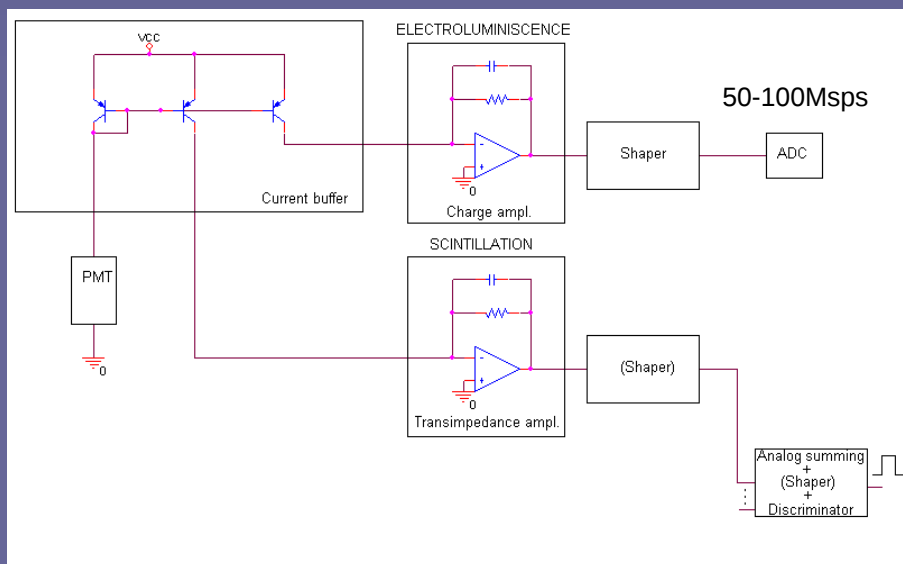
PMTs ~300 ch

- Scintillation light detection
 - Energy measurement
- Requirements:
 - Energy resolution better than 1%
 - Space resolution 1mm to 2cm ($1\text{--}20\mu\text{s}$)

PMTs



- 22x22mm² active area



Width: 20ns
Energy: single photon

Width: 3-42μs
Energy: ~50prim e-
(typ.)

High dynamic range

■ PMT's for:

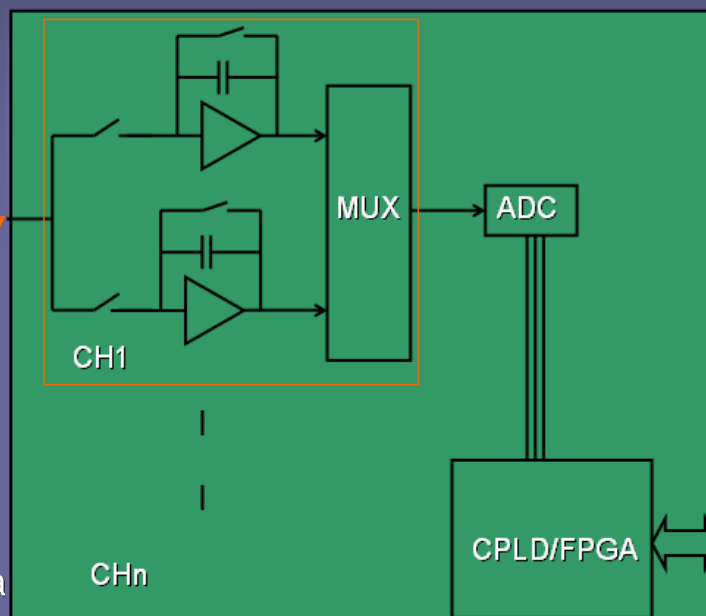
- Measure the electroluminescence light with great resolution and
- Detect the scintillation light to measure the drift time.

SiPMs

- New type of photon-counting device made up of multiple APD (avalanche photodiode) pixels operated in Geiger mode



- $1 \times 1 \text{ mm}^2$ - $3 \times 3 \text{ mm}^2$ active area



Gate charge integrator
Integration time = $1 \mu\text{s}$
(to reduce data)
~10K ch

