Francesco Pomilio & Matteo Olivieri
Supervisor: Marco Bozzo

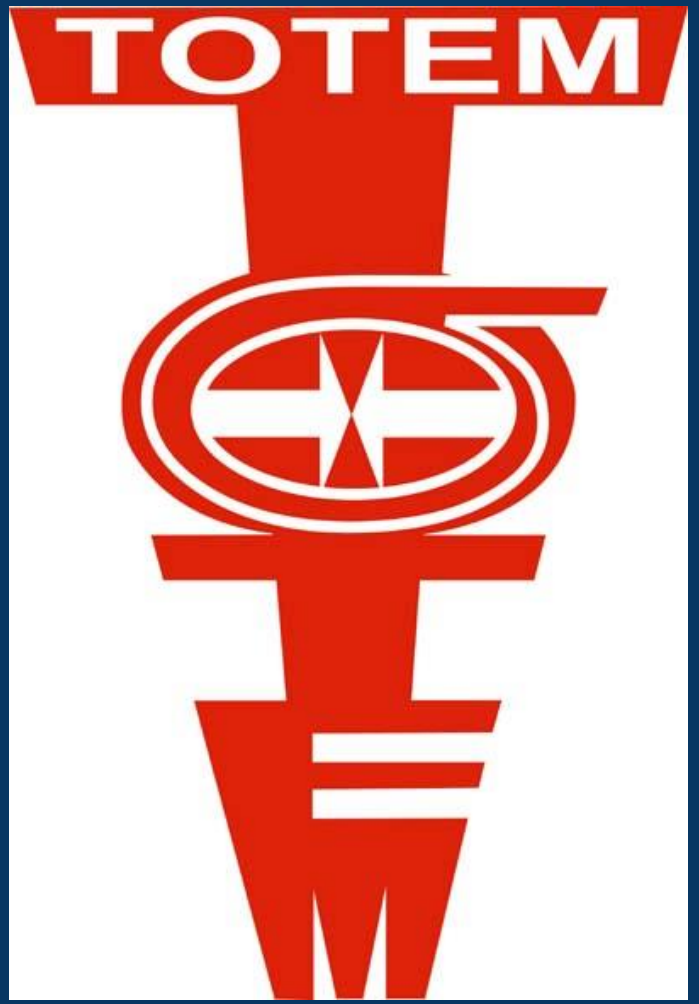
TOTEM

What is TOTEM?

Not this…

So, what is TOTEM?

- TOTal cross-section, Elastic scattering, diffractive dissociation Measurement
- Proposed 1997 (LoI)
- About 500 m long
- About 100 scientists



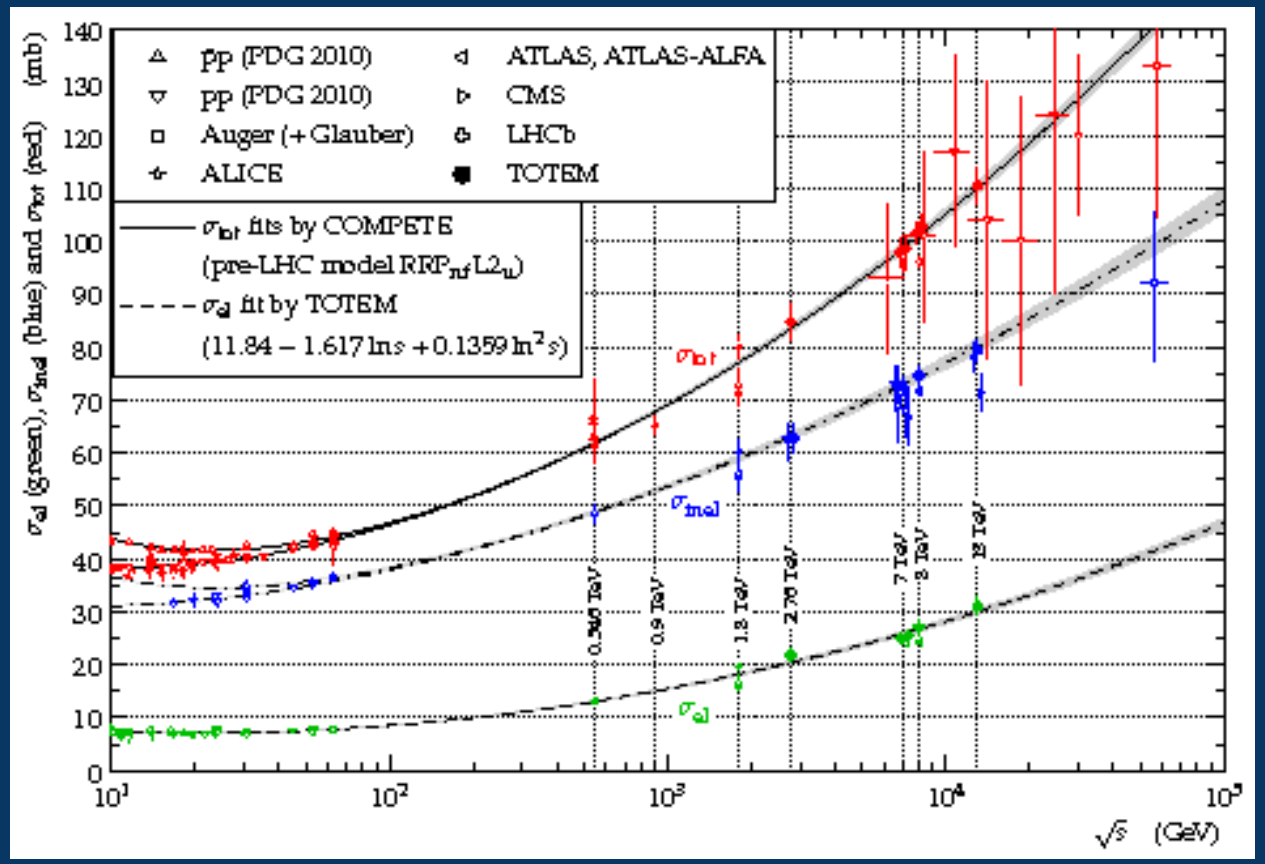
The total cross-section

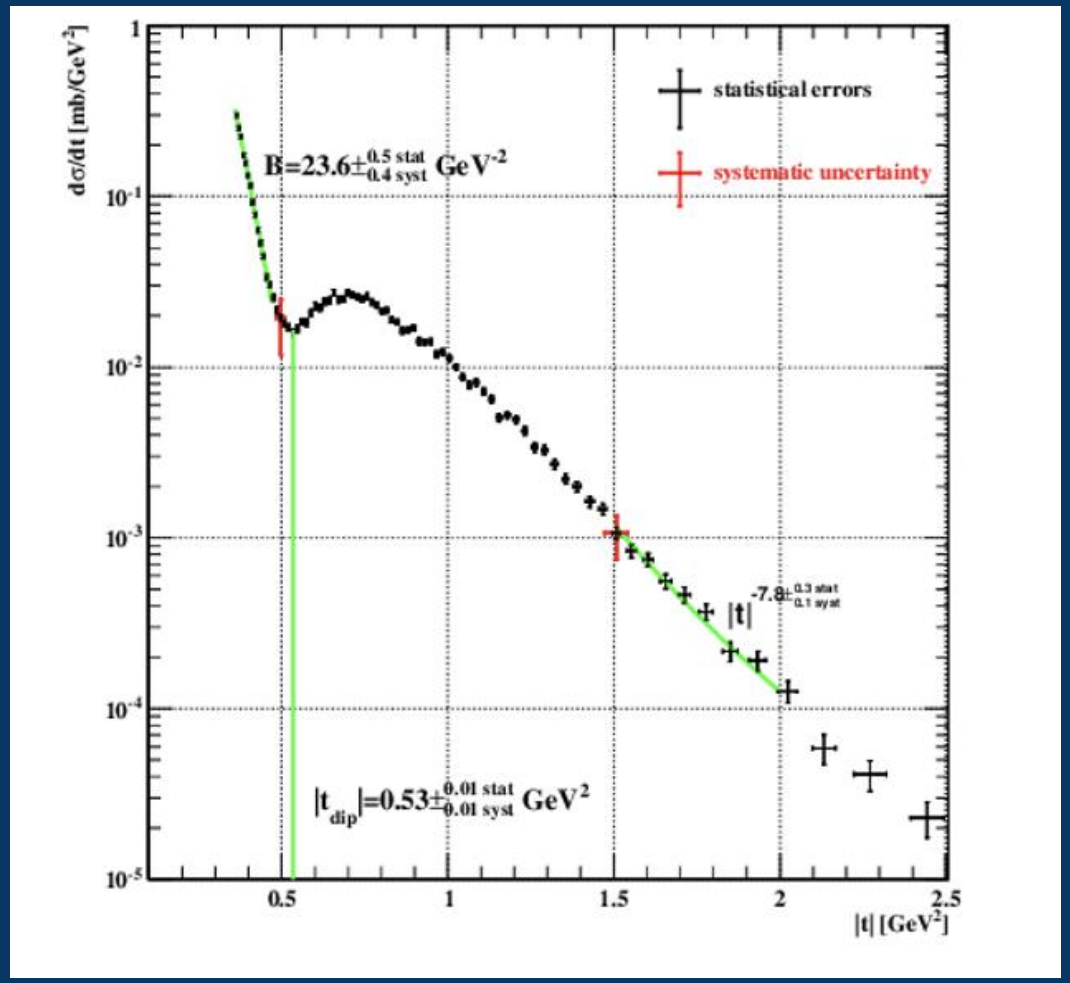
$$\sigma = \frac{16\pi}{1+\rho^2} \frac{\frac{dN_{el}}{dt}}{N_{el} + N_{inel}}$$

Practically the same thing…

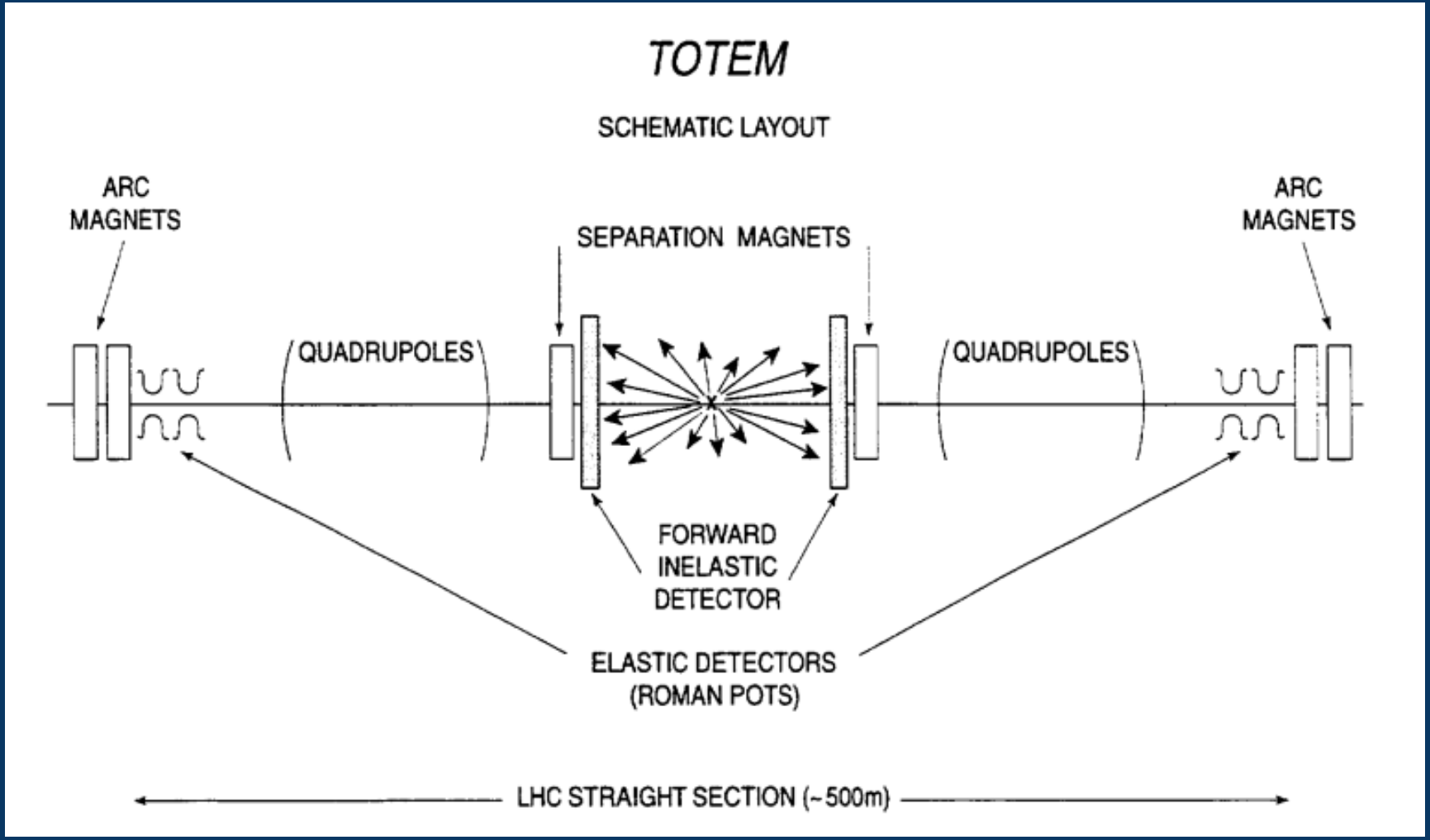
1 mbarn = 10E-24 cm^2

The total cross-section

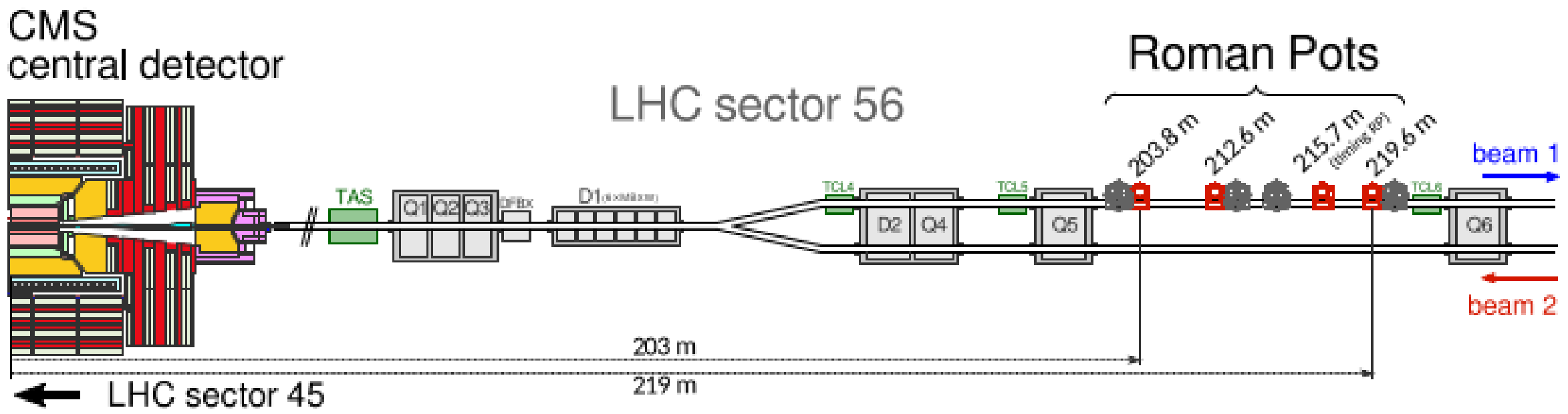




TOTEM: approximate structure



TOTEM: where are we?



The Roman Pot:

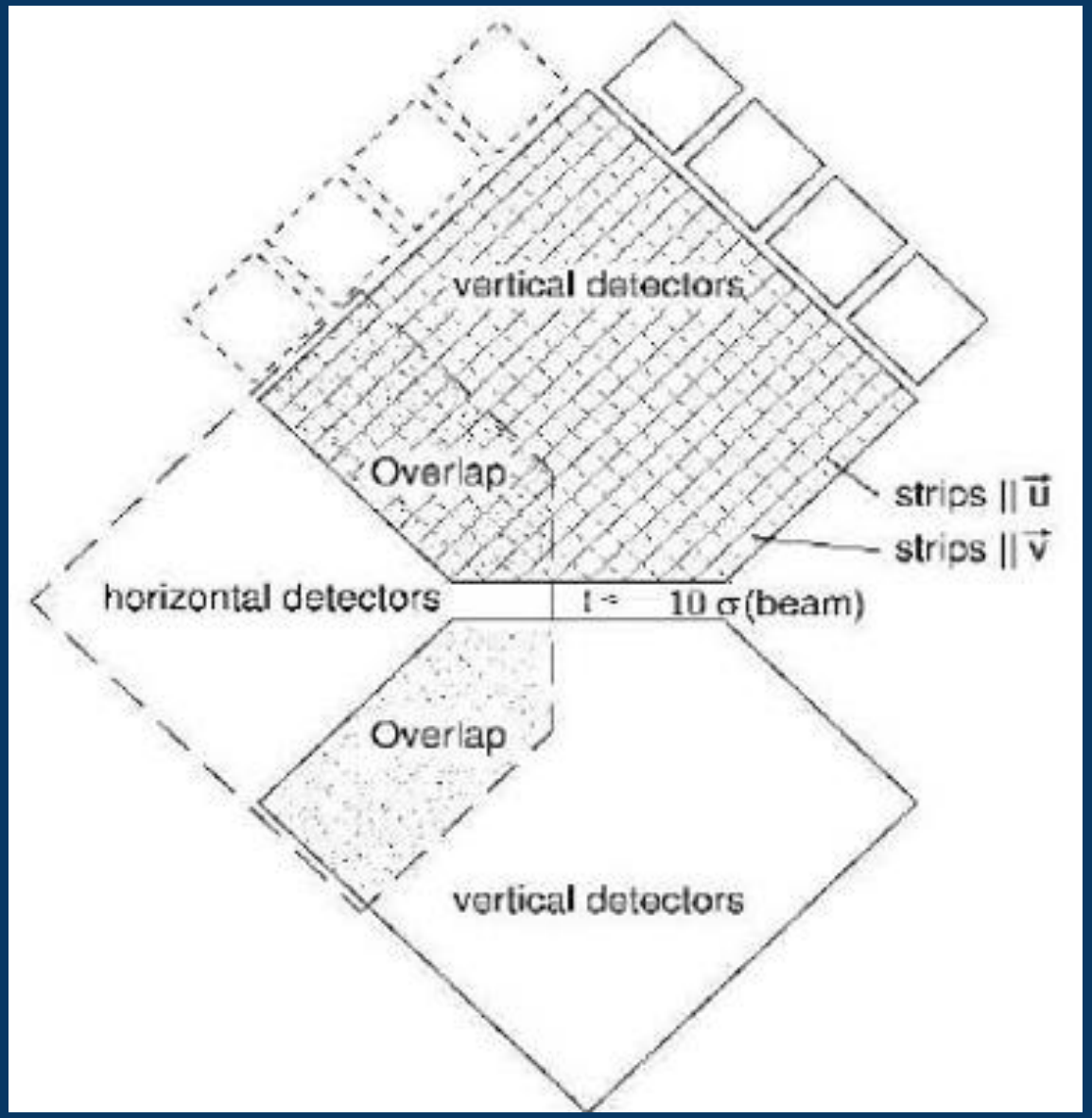
not this…

The (real) Roman Pots

- Aim: take the detectors the nearest possible to the beam → when the beam is stable!
- First used for ISR
- Vacuum chamber to avoid beam colliding with residual gas
- Cooling system for the electronics

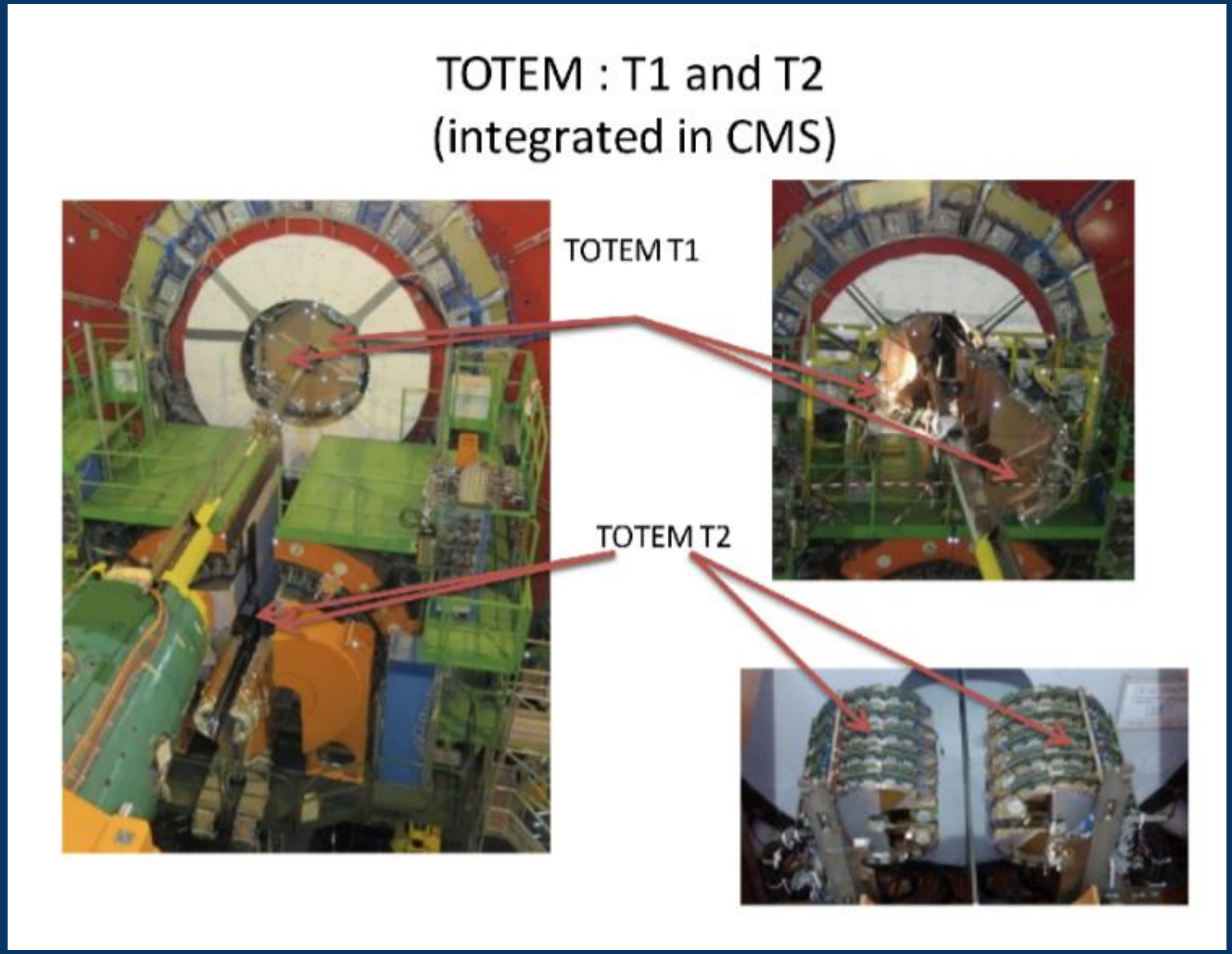
Silicon detectors

- Elastic events
- Kind of naval battle
- Evolution: pixel detectors



Diode strips pitch: 55 micron

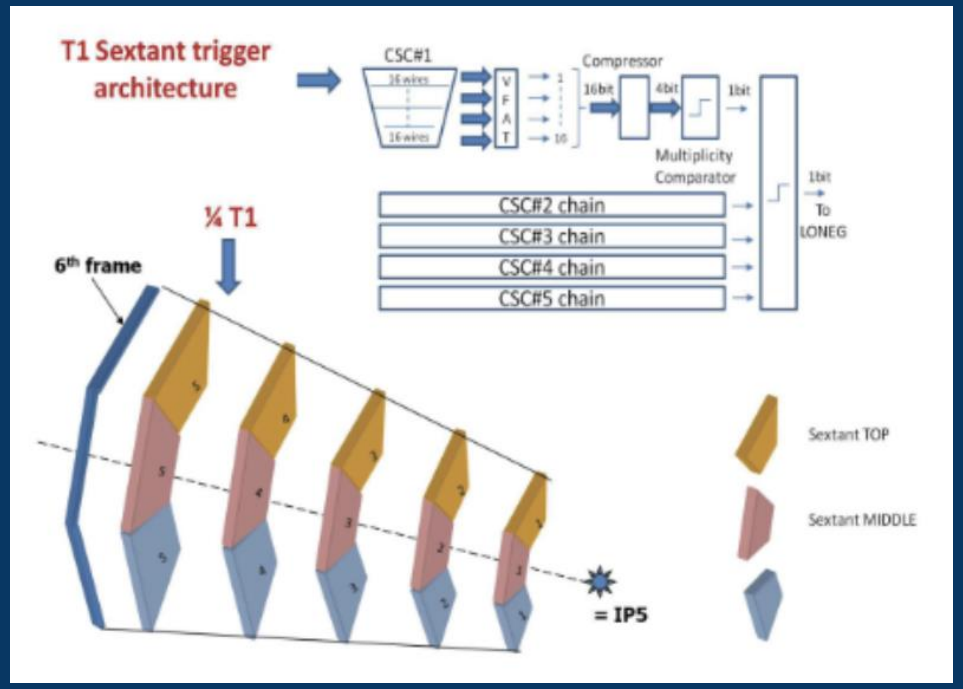
T1 & T2

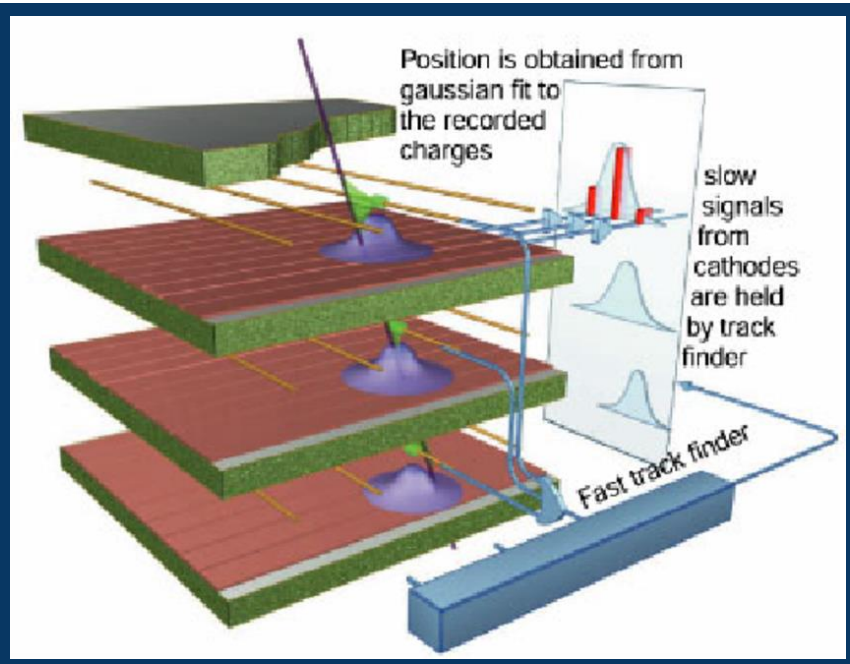


T1

- Particle tracker
- Identifies products of inelastic events
- Counts charged particle
- 5 planes of Cathode Strip Chambers (multiwire proportional chamber)

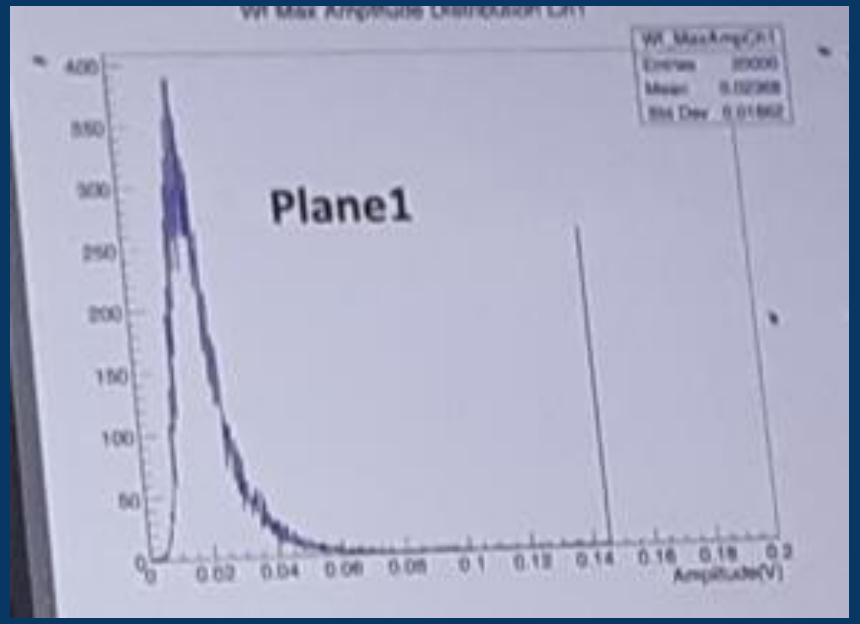
- TPC (Time Projection Chamber)





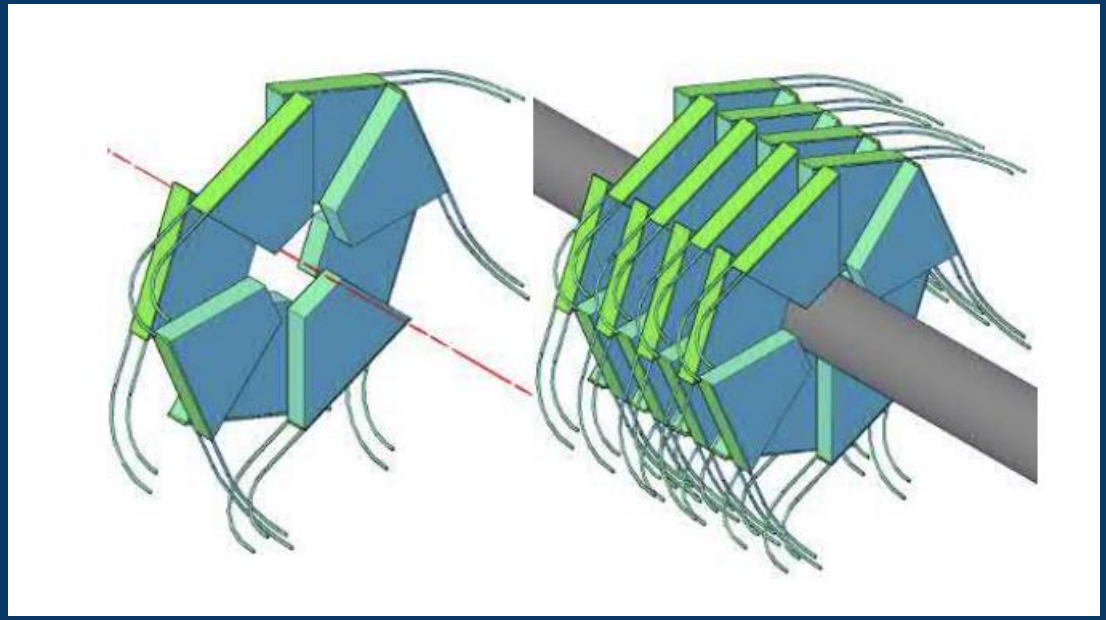
T2

The sign of a particle passed through the telescope



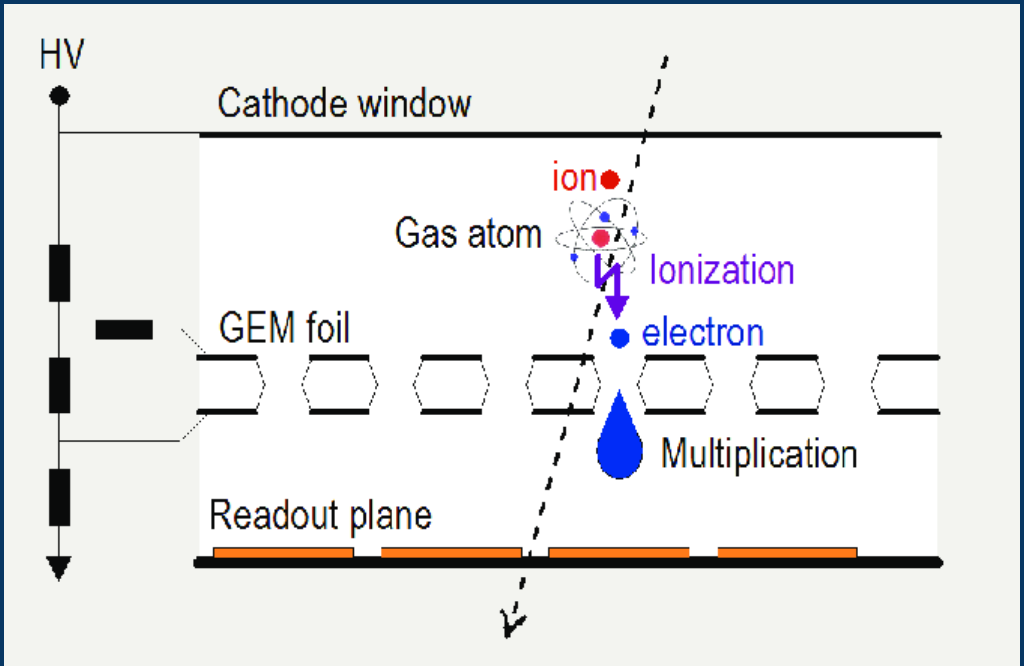
Observed events as a function of the amplitude

Particle tracker made of scintillators

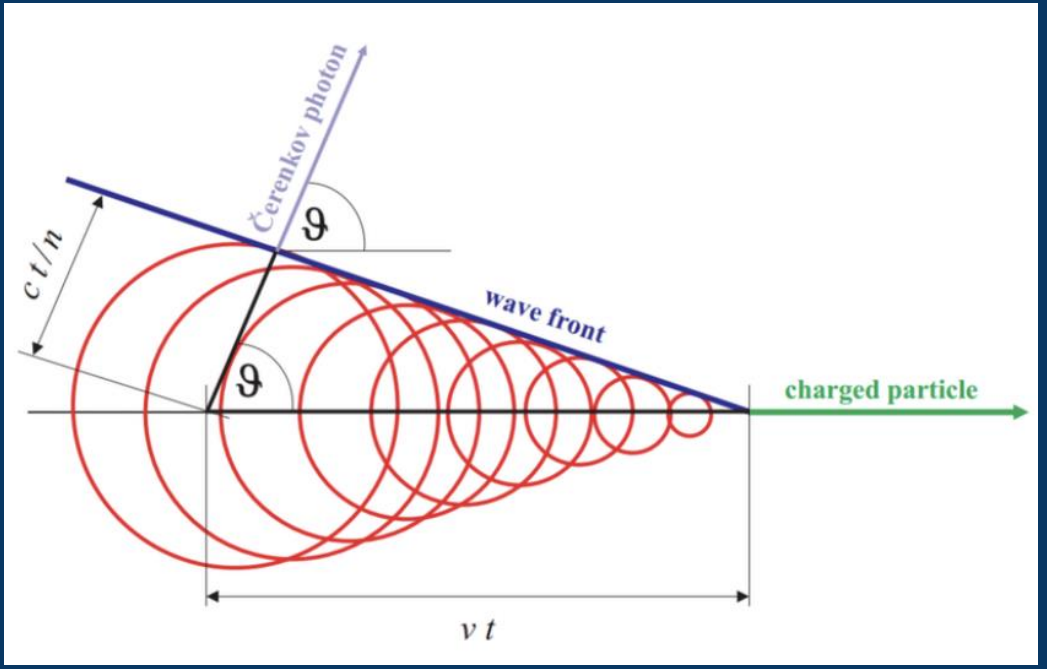


Other detectors

- GEM



- Crystals (using Cherenkov effect)



Bibliography & Sitography

- Letter of Intent, 1997
- TOTEM, 2004
- The new T2, 2019
- https://totem.web.cern.ch/Totem/

THE END

Special thanks to:

- Berkan Kaynak
- Diego Figueiredo
- Eraldo Oliveri
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