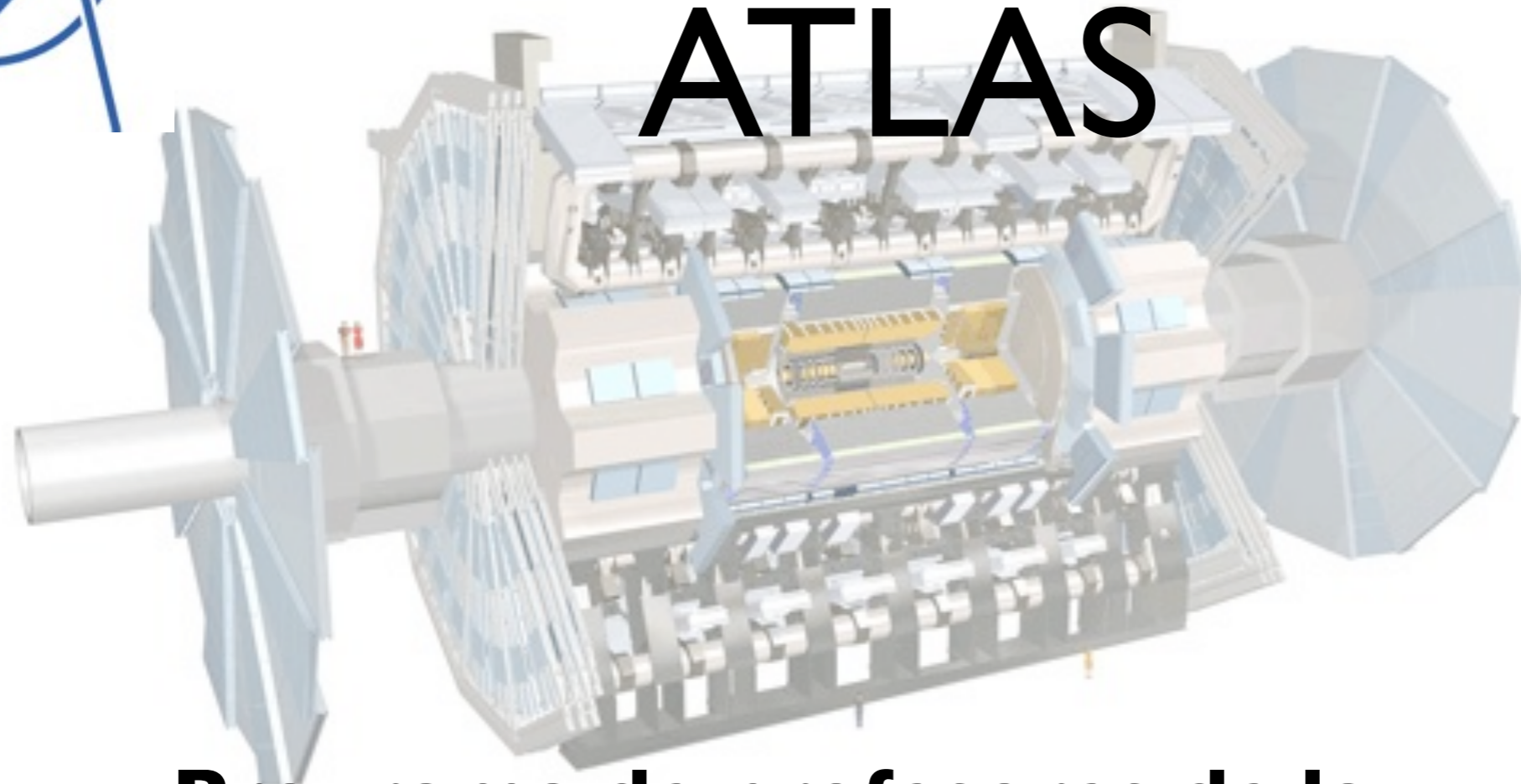




El detector ATLAS

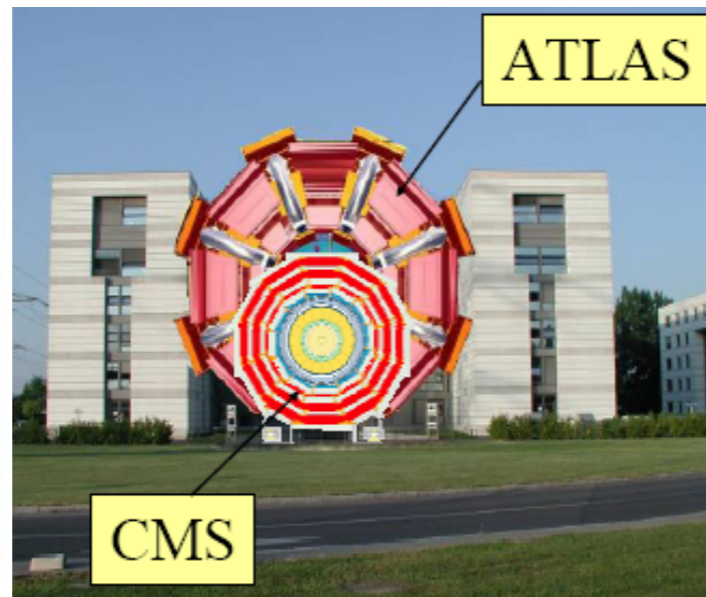
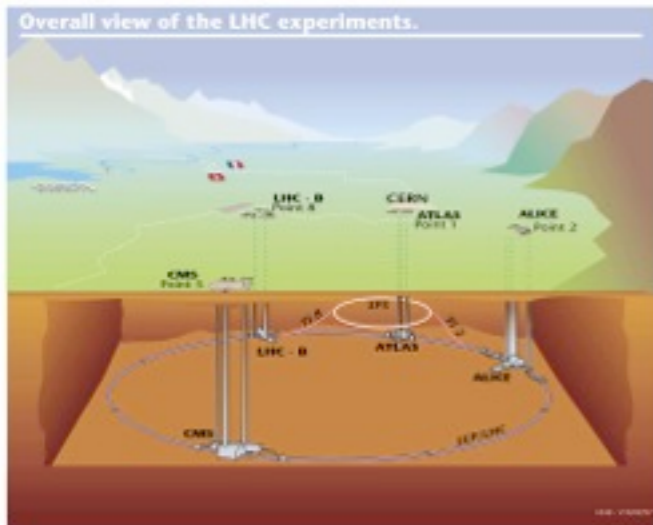


**Programa de profesores de la
República Dominicana**
Garoé González Parra



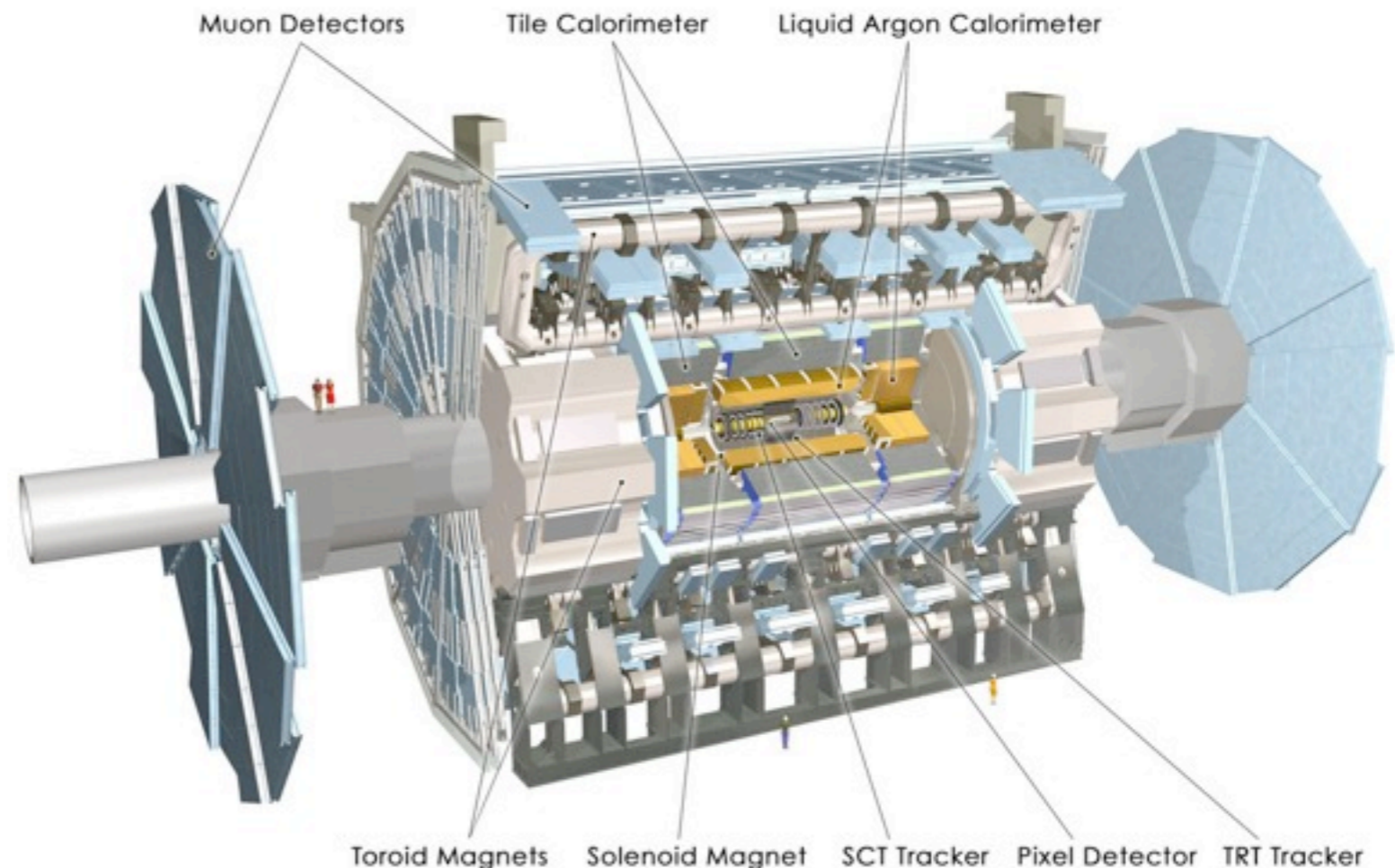


Los números de ATLAS



~3000 físicos e ingenieros
172 instituciones
38 países

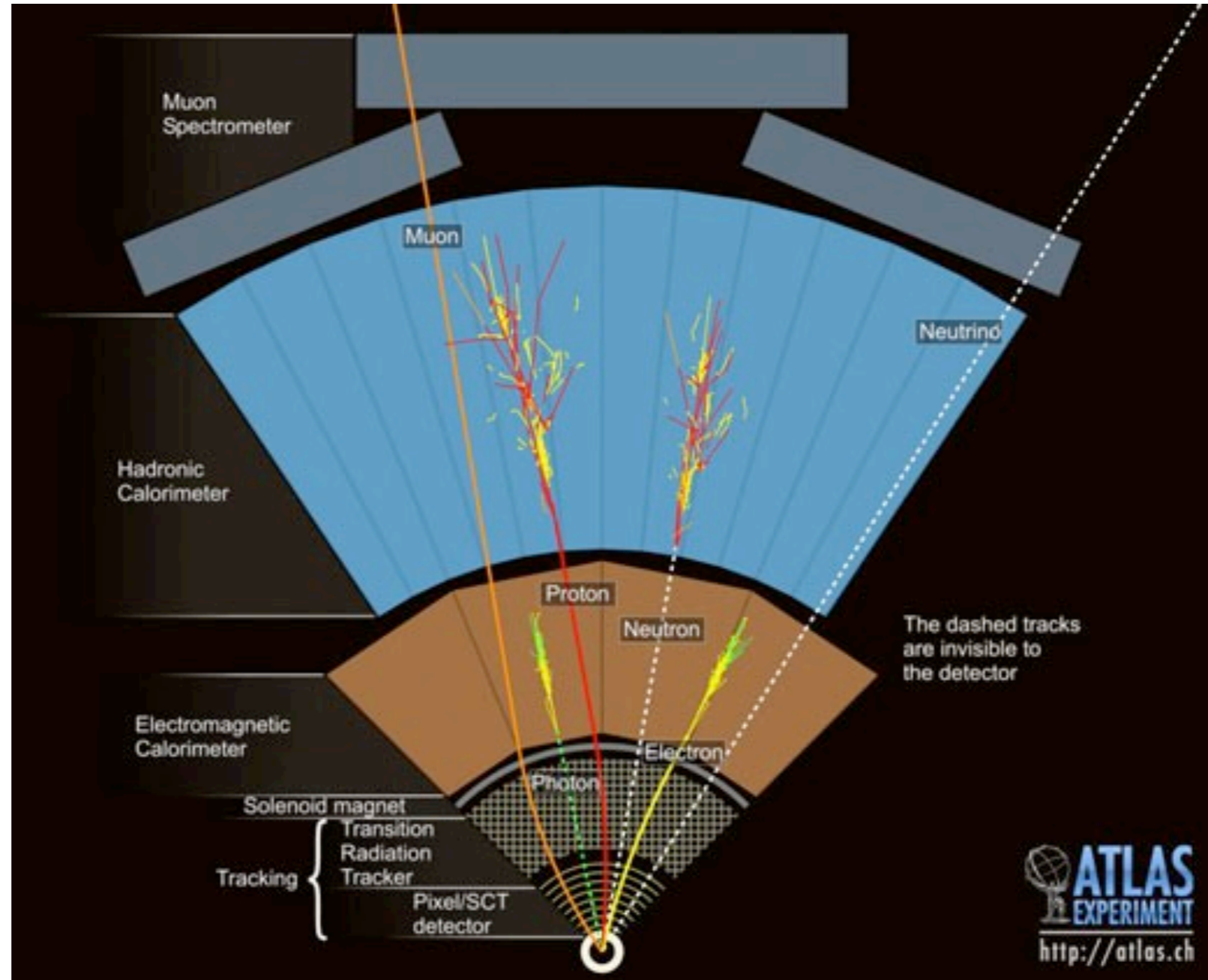
45 m largo y 25 m de diámetro
7000 toneladas
92 m bajo tierra
Único detector en Suiza

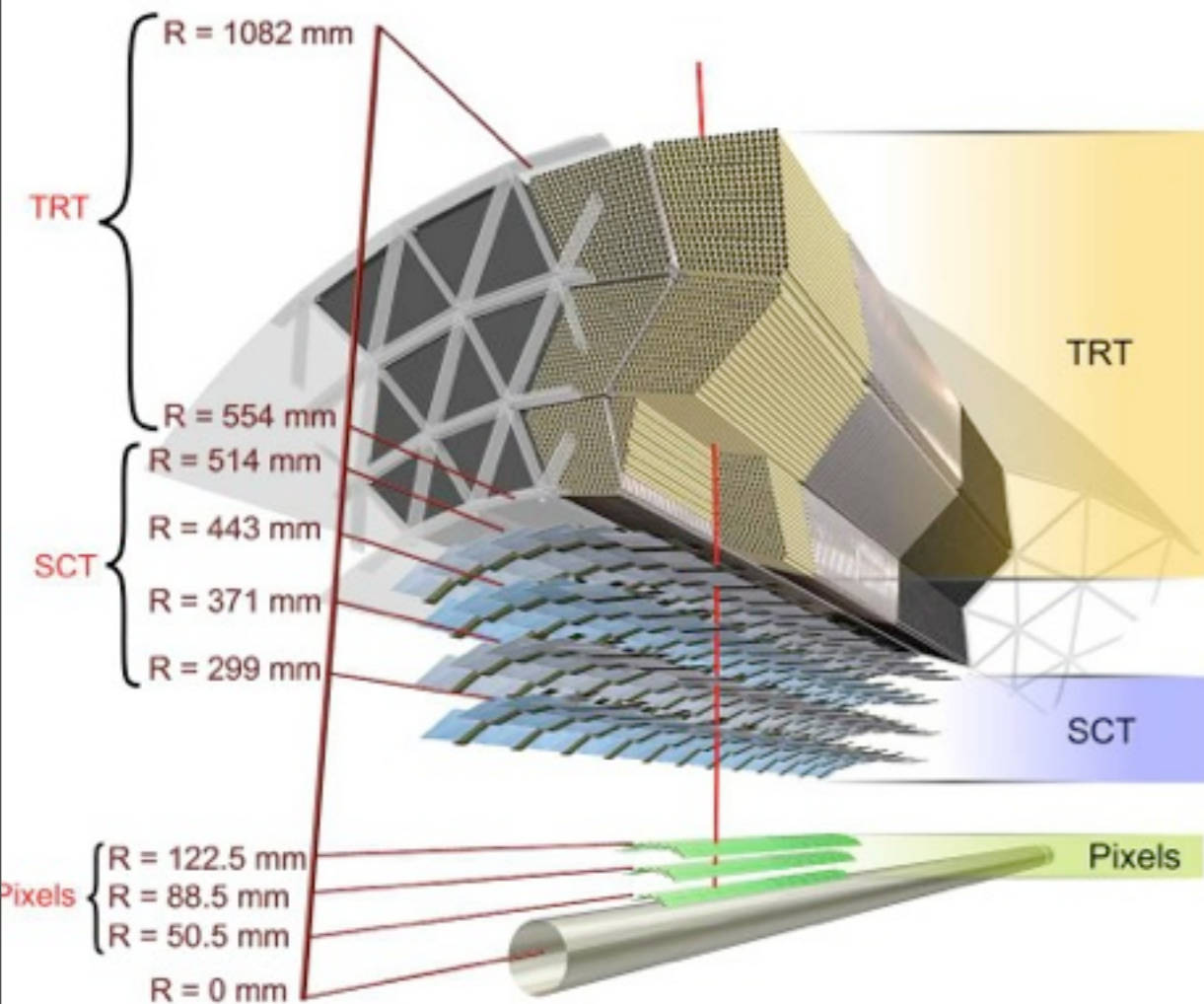






ATLAS





Transition Radiation Tracker (TRT)

298 000 tubos de deriva de 4mm en 36 capas. Resolución $200 \mu\text{m}$.

SemiConductor Tracker (SCT)

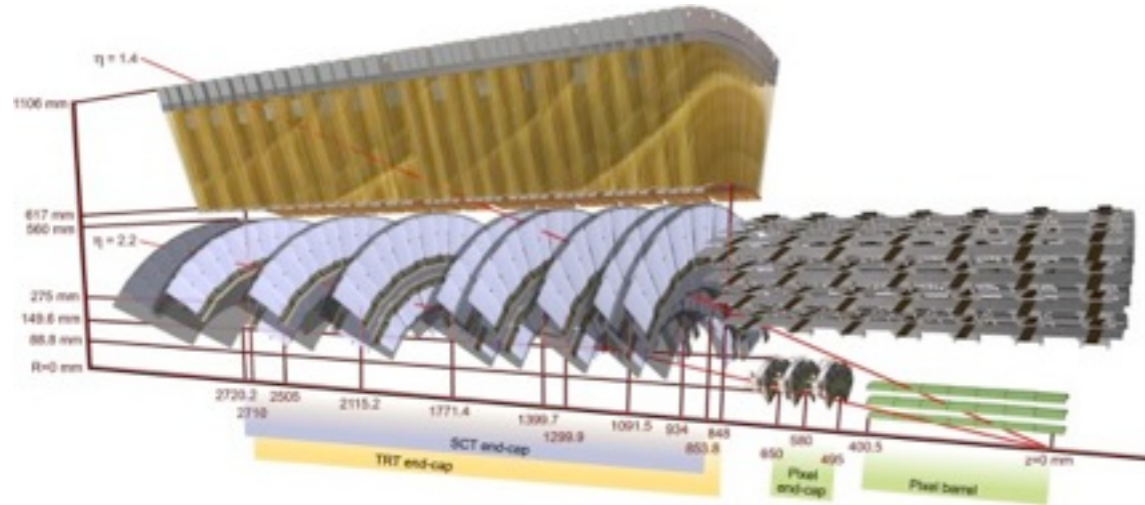
6.4 millones de canales en 4 capas de micro líneas de silicio de dos caras. Resolución $80 \mu\text{m}$.

Pixels

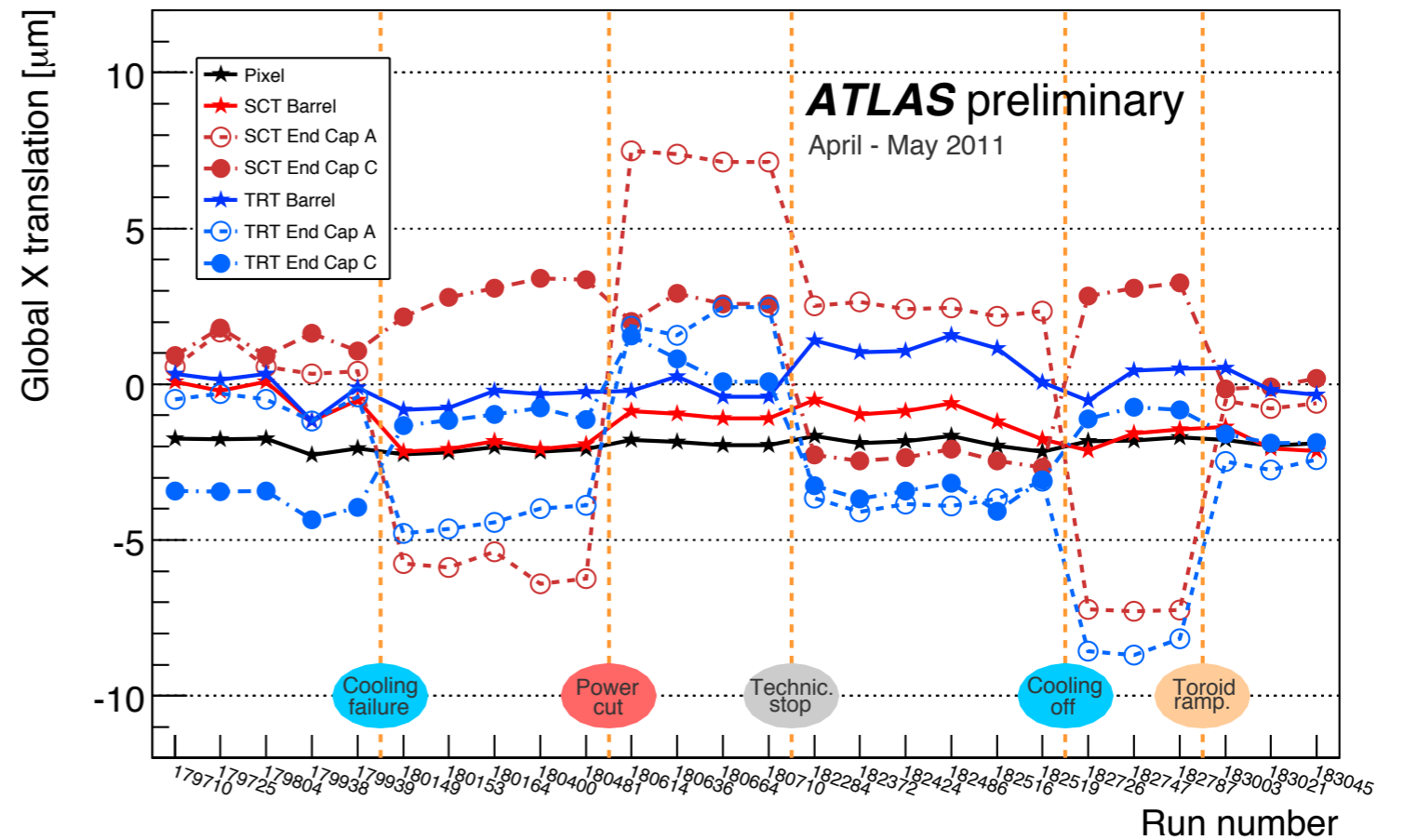
80 millones pixeles de silicio en 3 capas. Resolución $50 \times 400 \mu\text{m}$



Detector interno

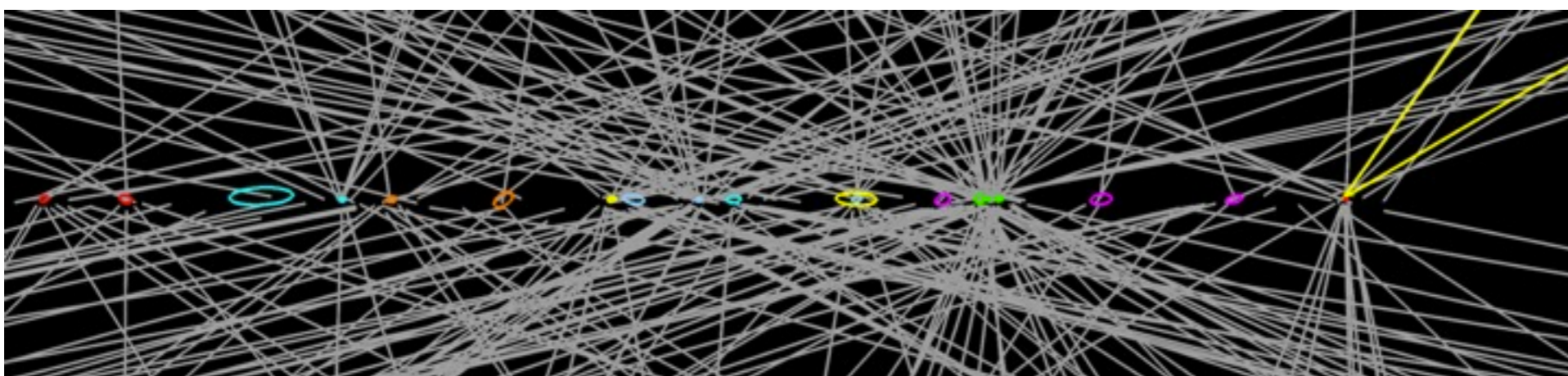
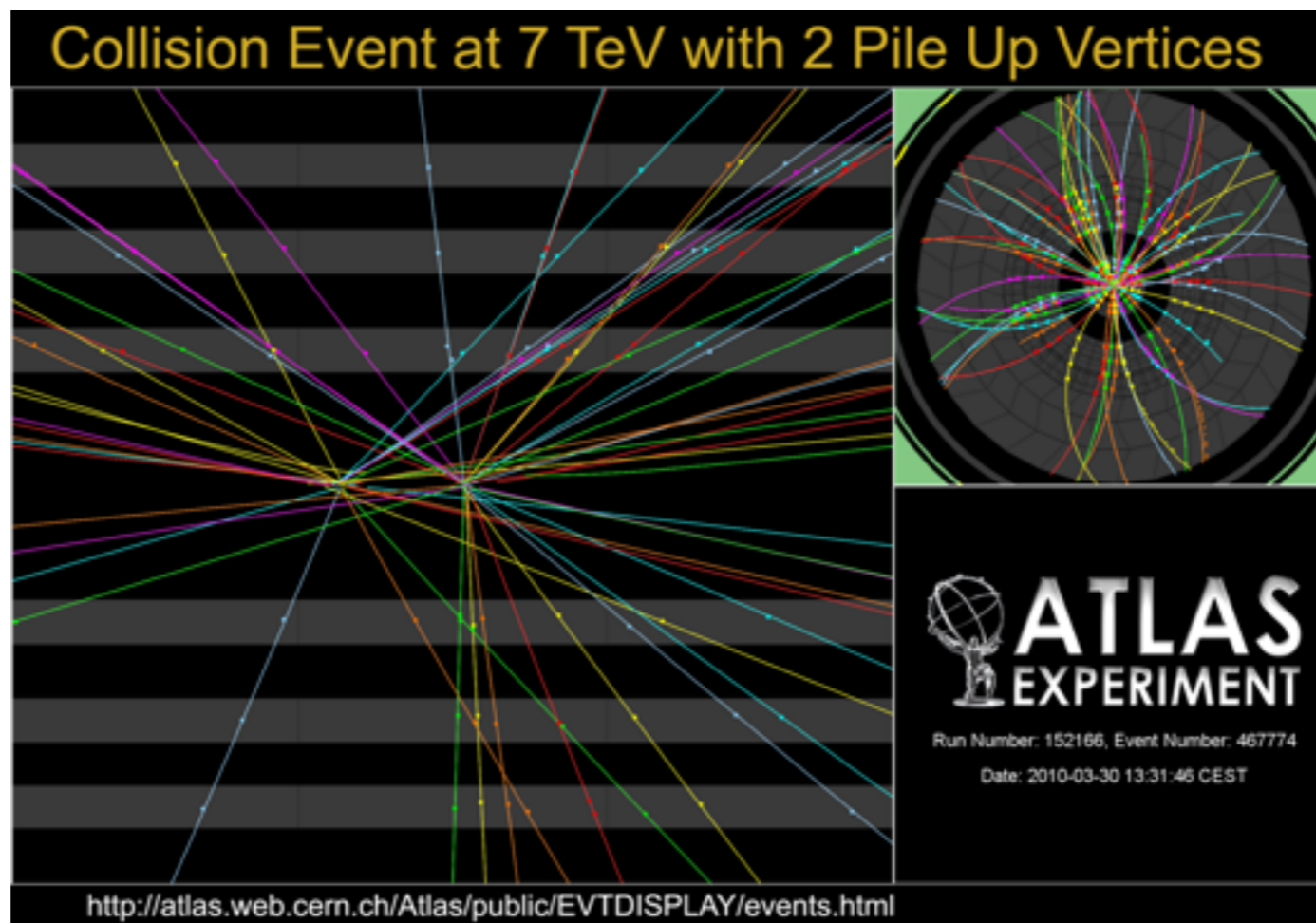


Level 1 alignment





Eventos



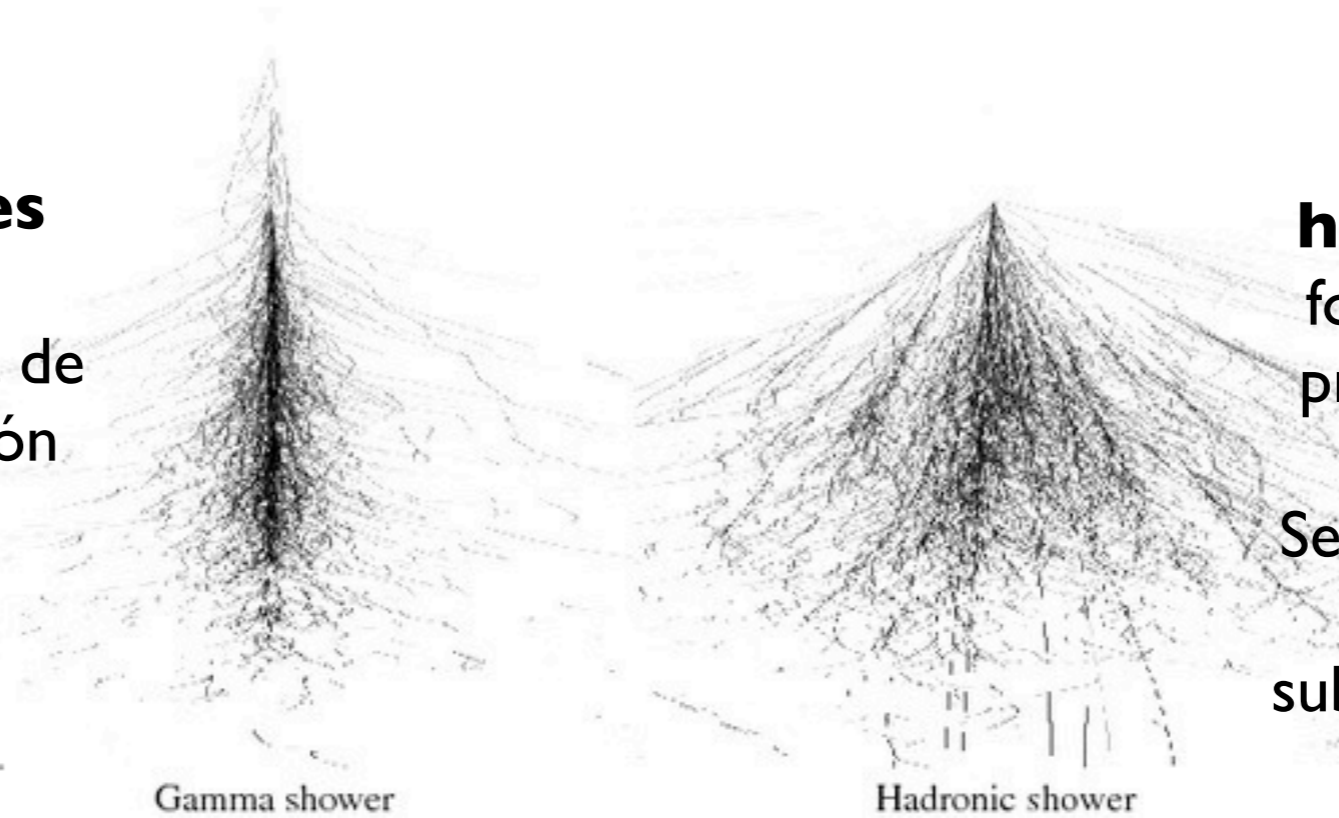
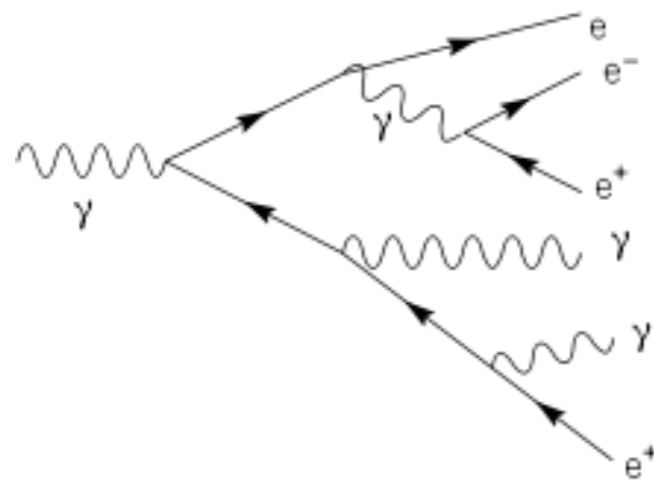
20 colisiones a
8 TeV



5cm

electrones y fotones

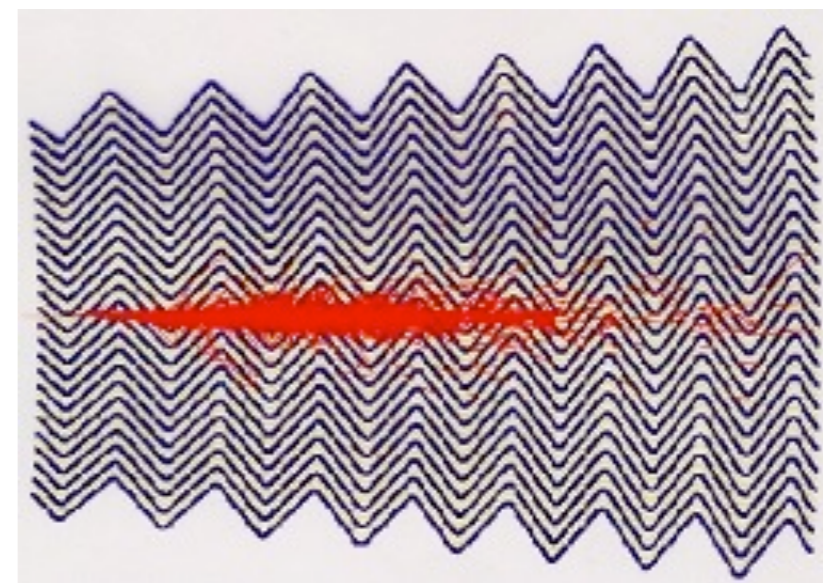
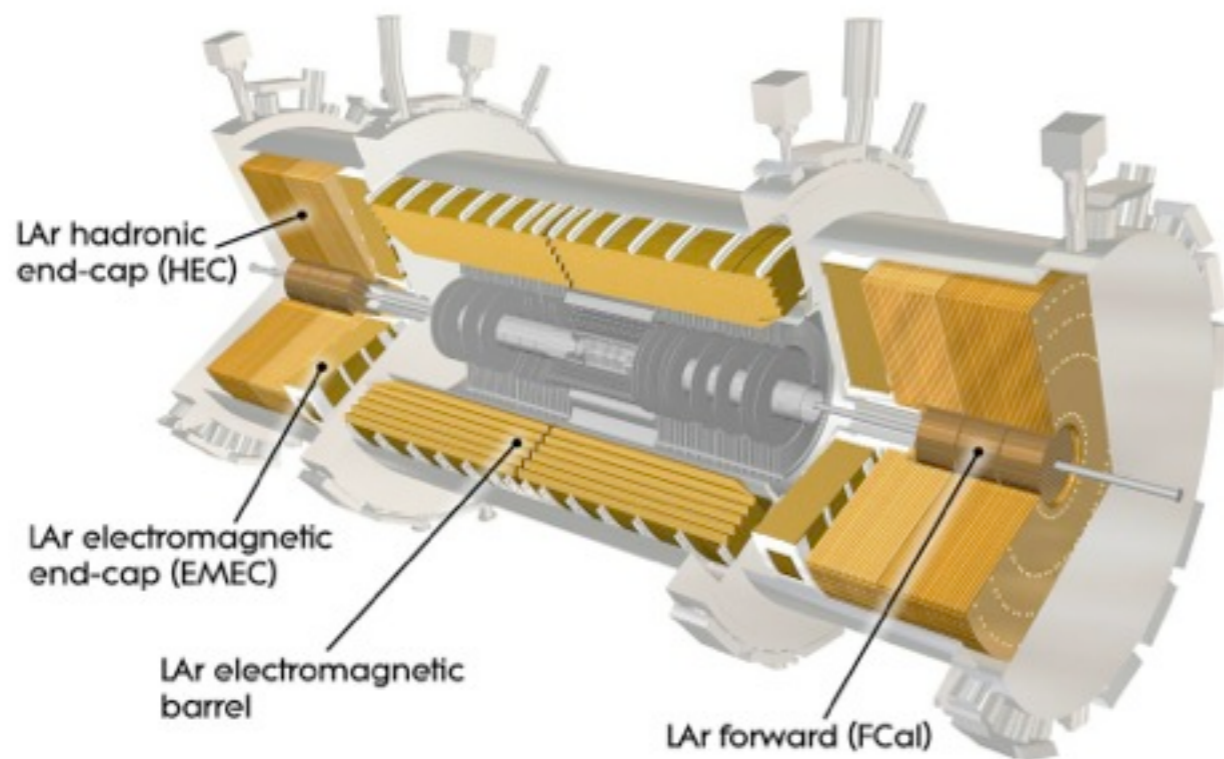
Pierden energía en forma de Bremsstrahlung y creación de Pares



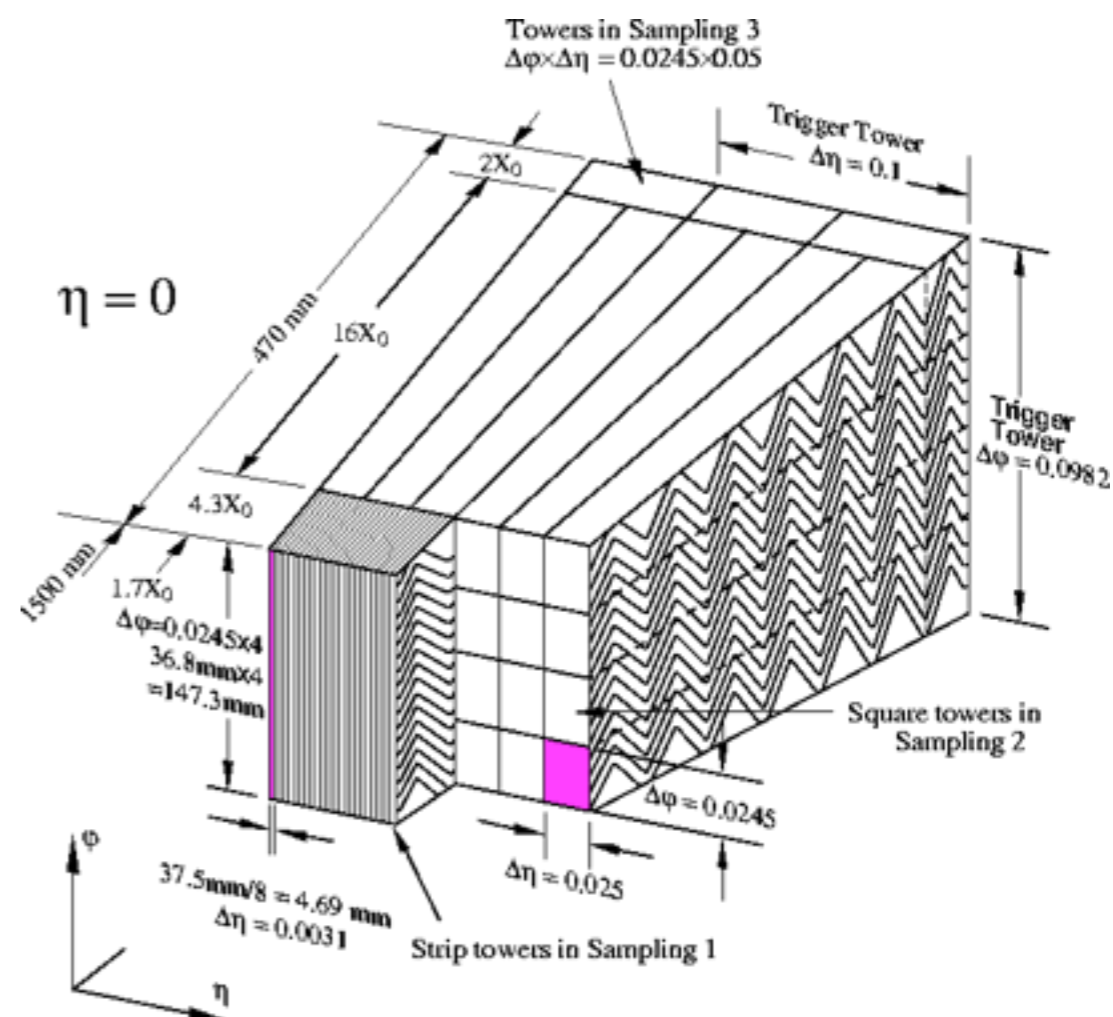
hadrones (partículas formadas por quarks): protones, neutrones,...

Se producen reacciones nucleares y las subsiguientes reacciones electromagnéticas

Los calorímetros de ATLAS tienen elementos de absorción y de detección.

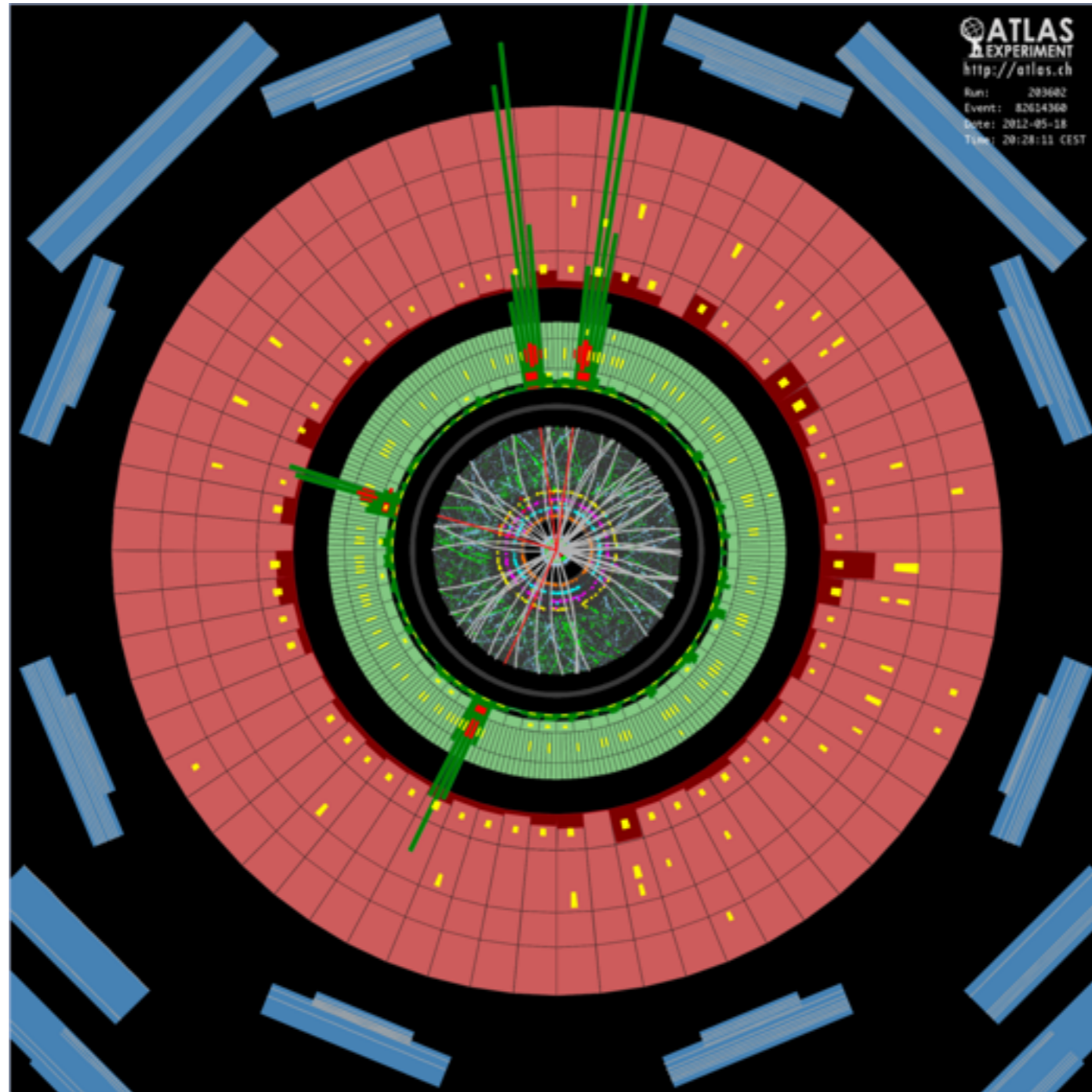


Elemento absorbente: Plomo, Cobre
 Elemento de detección: Argón líquido (88K)



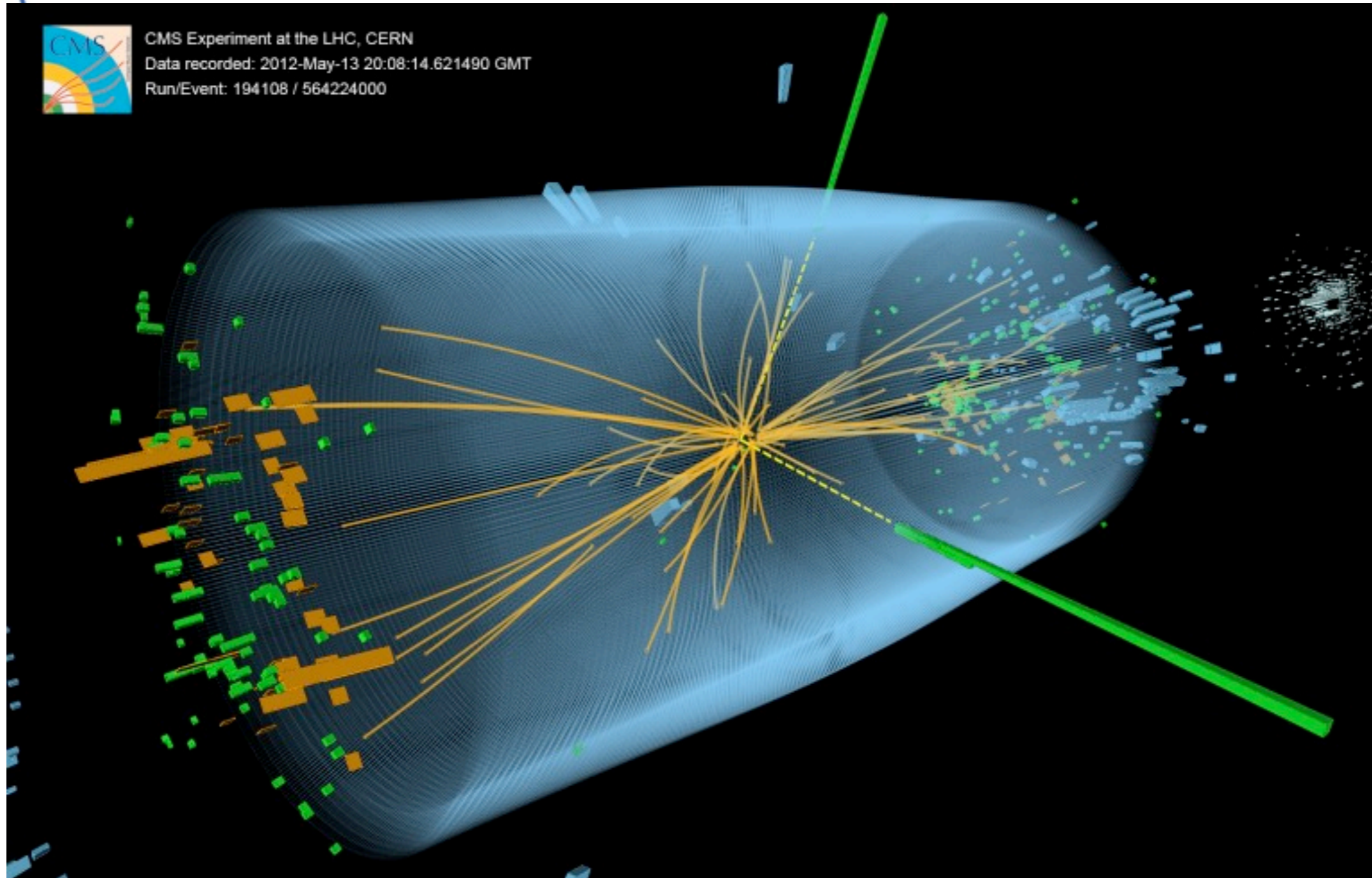


Evento



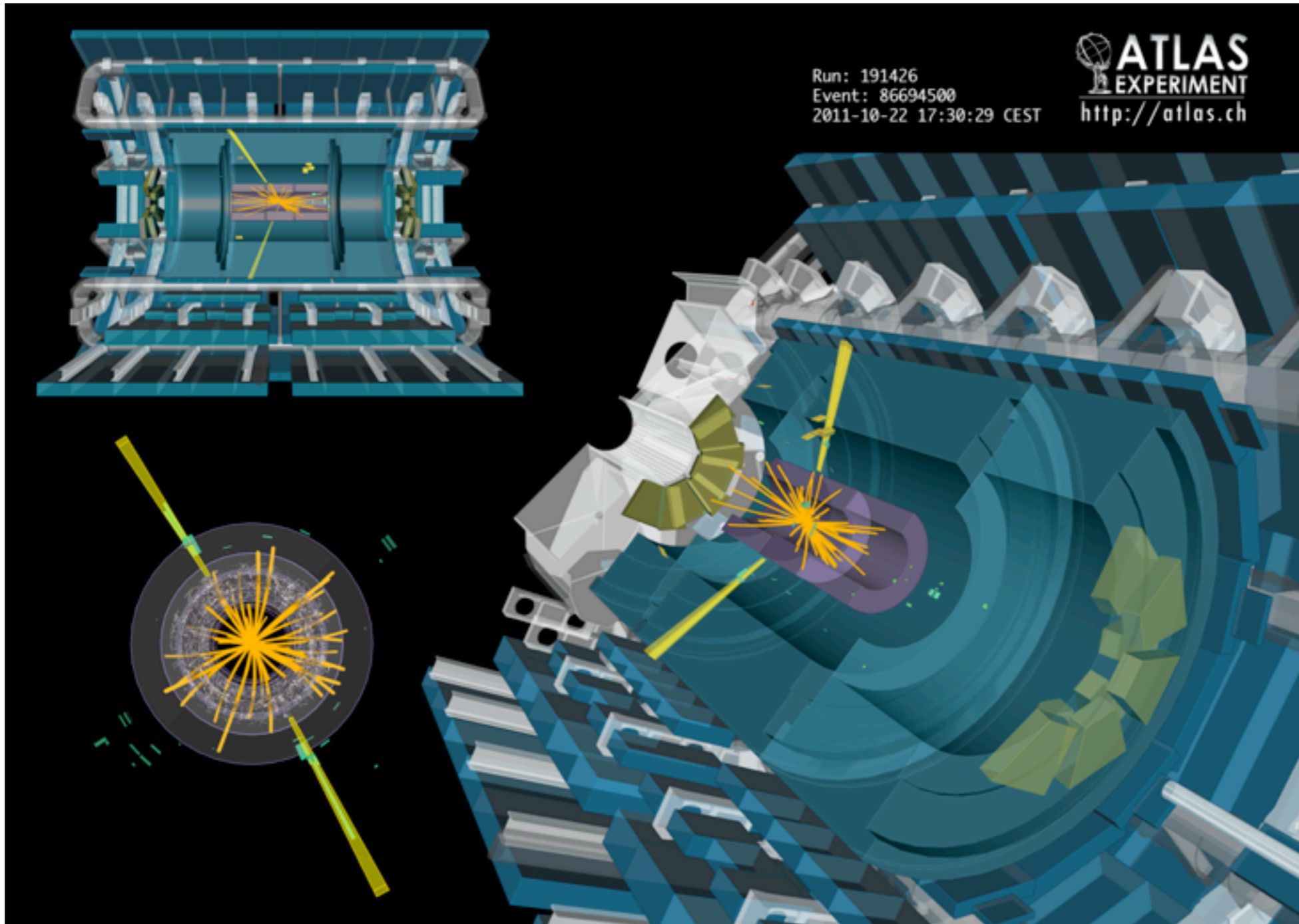


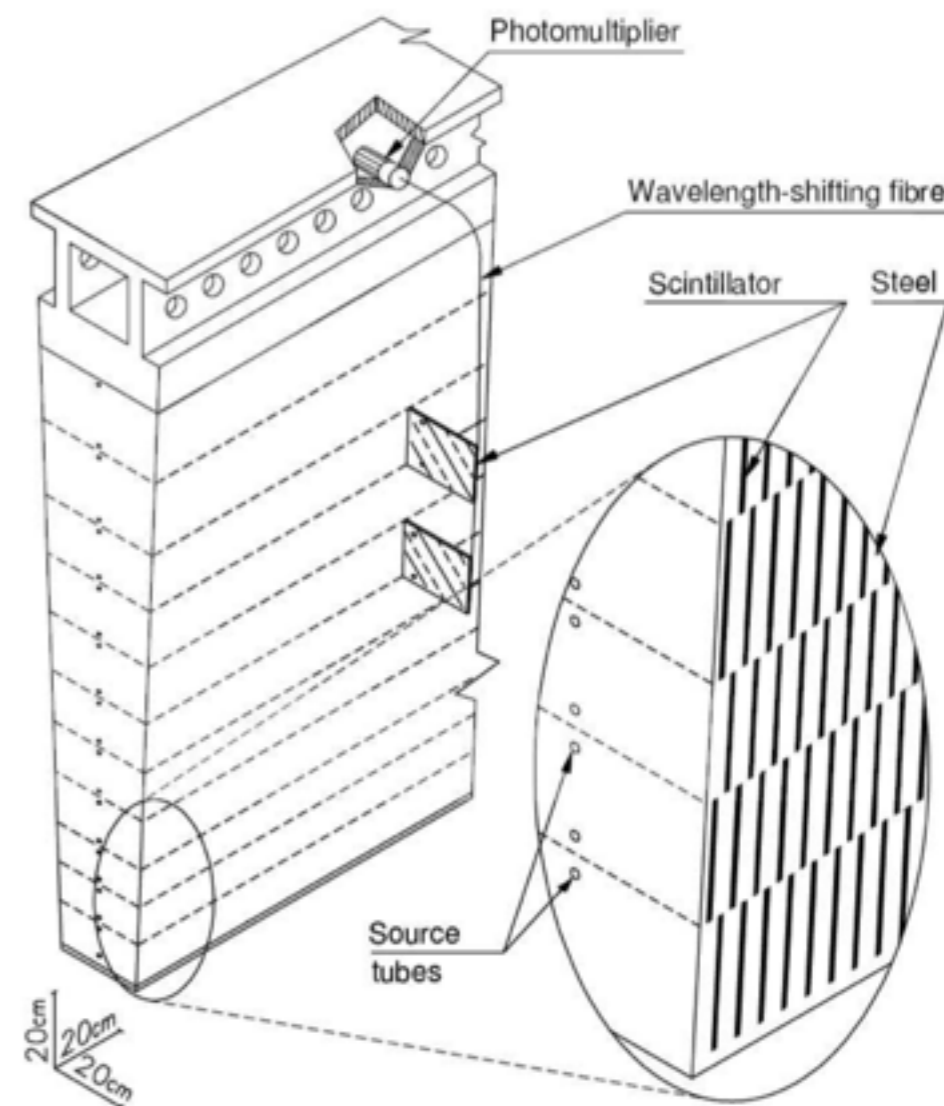
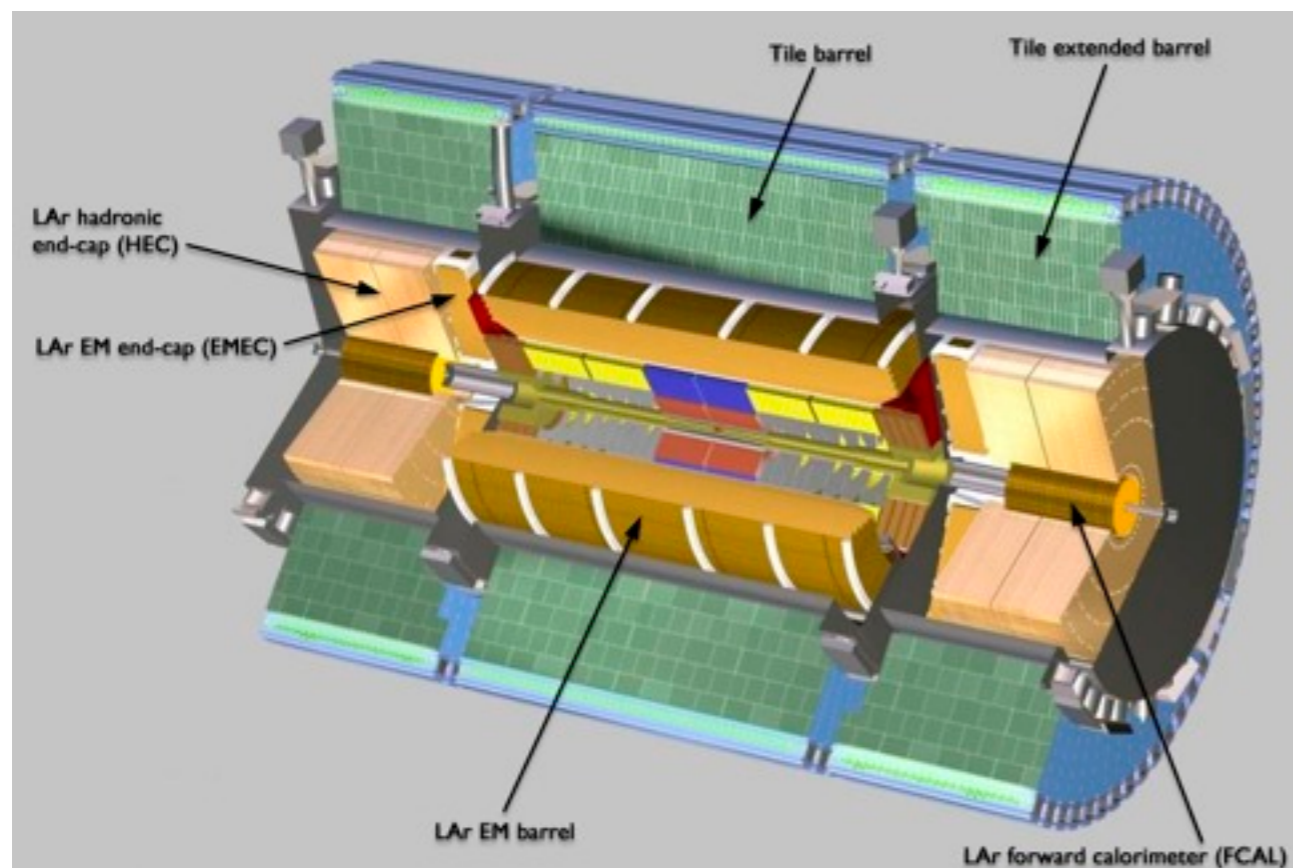
Calorímetro electromagnético





Evento





Elemento absorbente: Acero

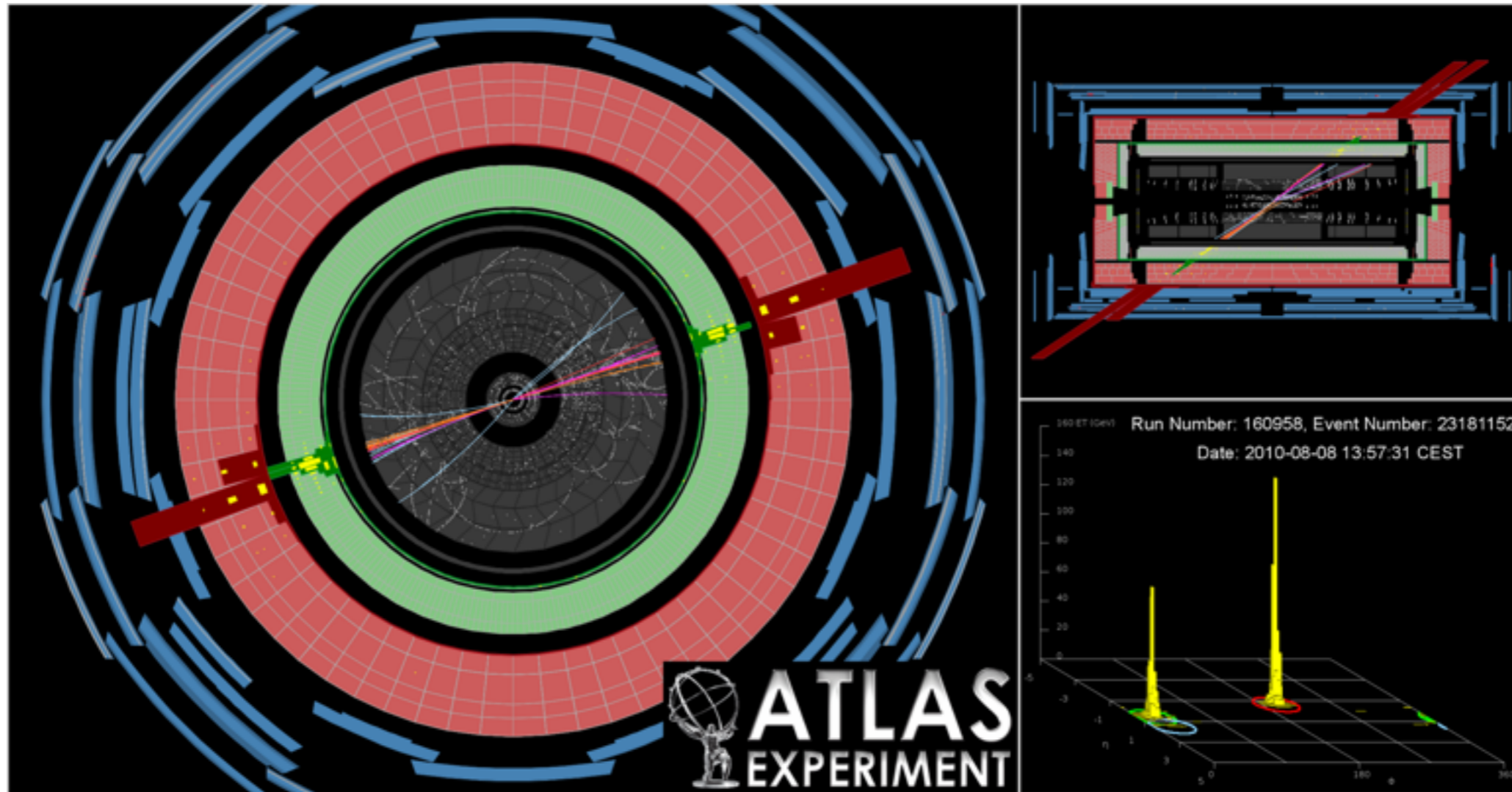
Elemento de detección: Plástico centellador

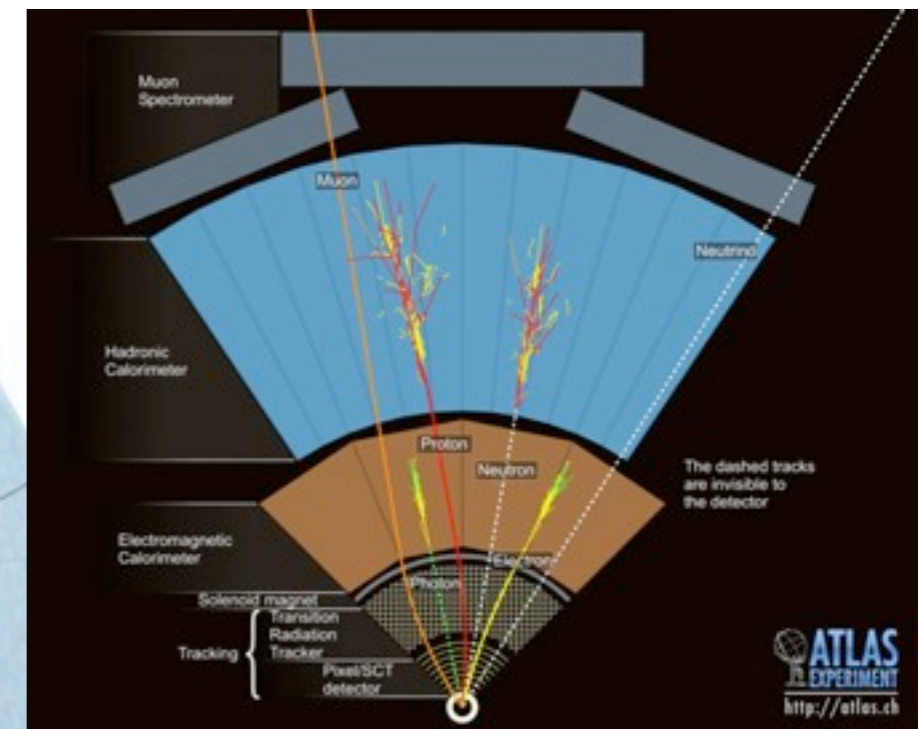
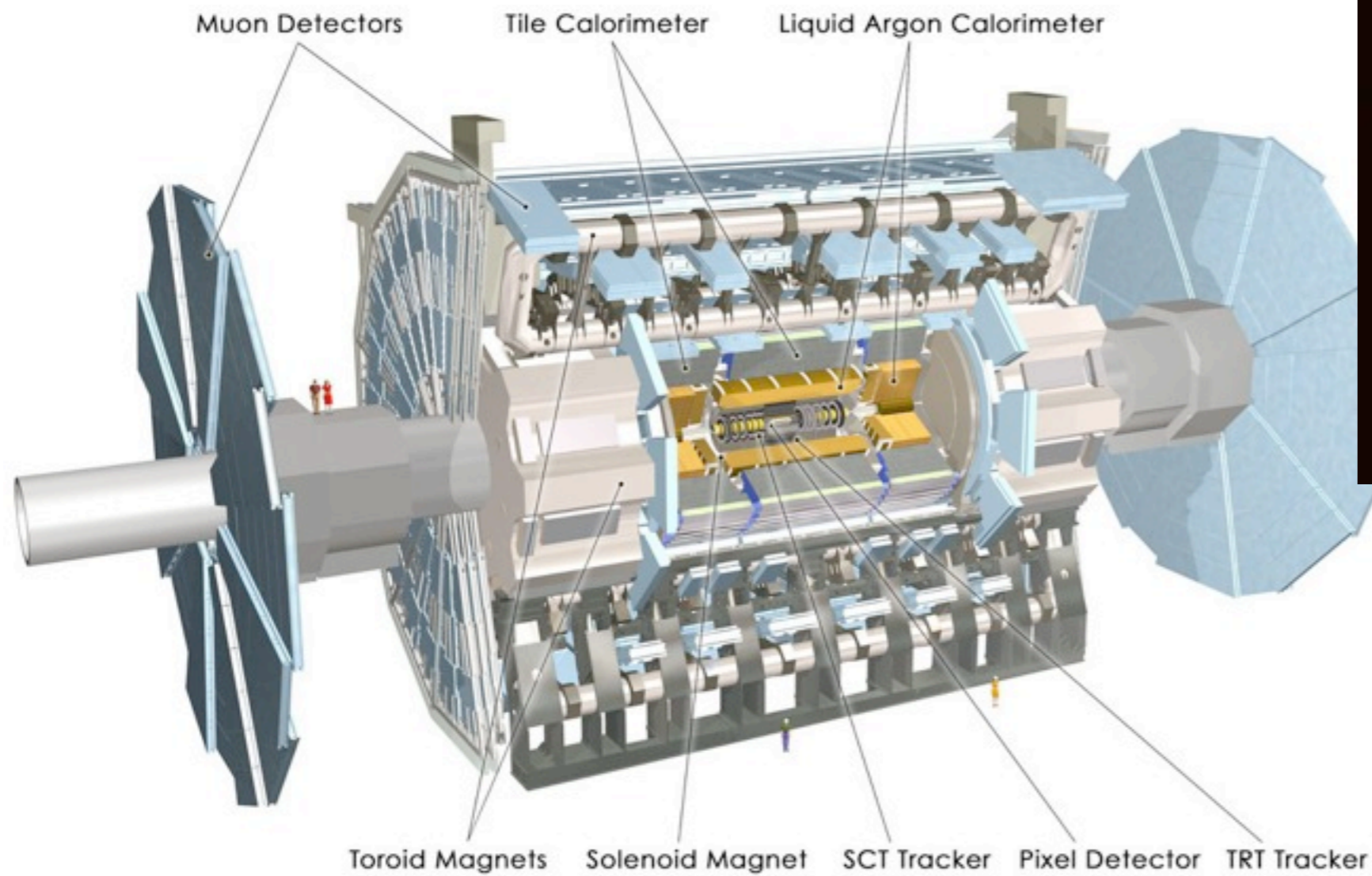
12m largo x 1.3 m de radio

4 particiones x 64 módulos x ~45 PMT = **10000 canales**

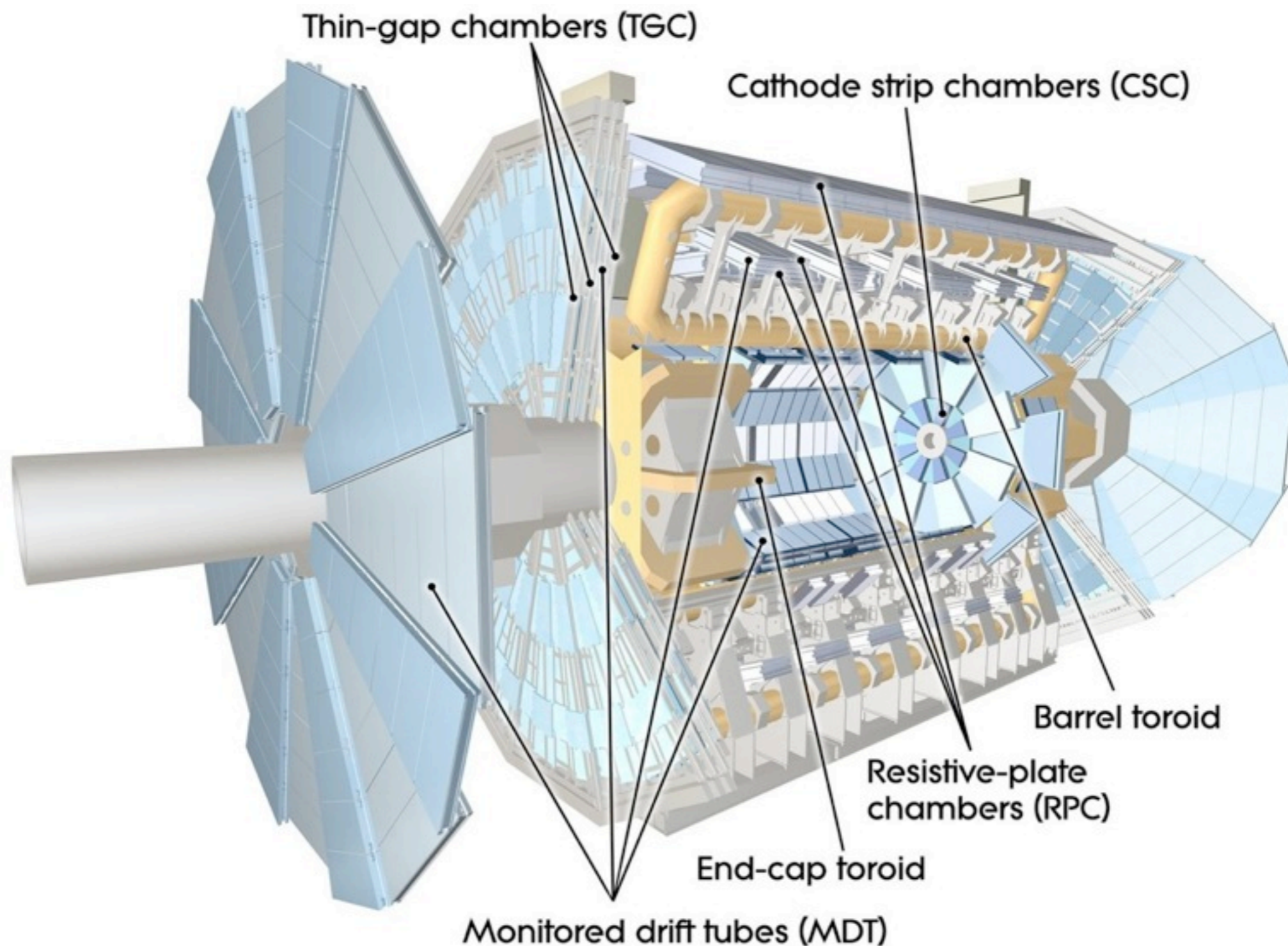


Evento





Espectrómetro de muones





Espectrómetro de muones



Cathode Strip Chamber (**CSC**)
40/5mm

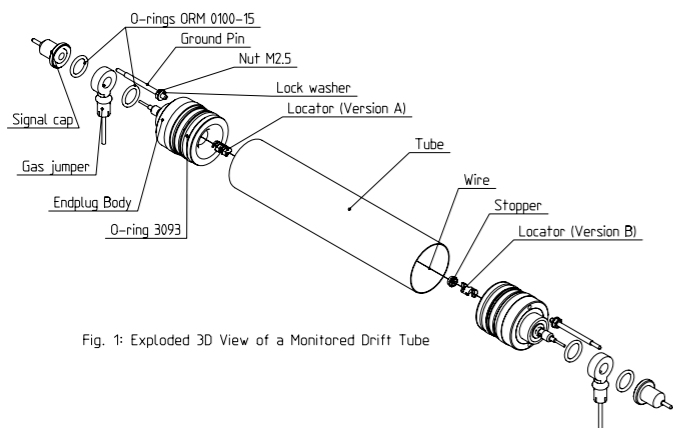
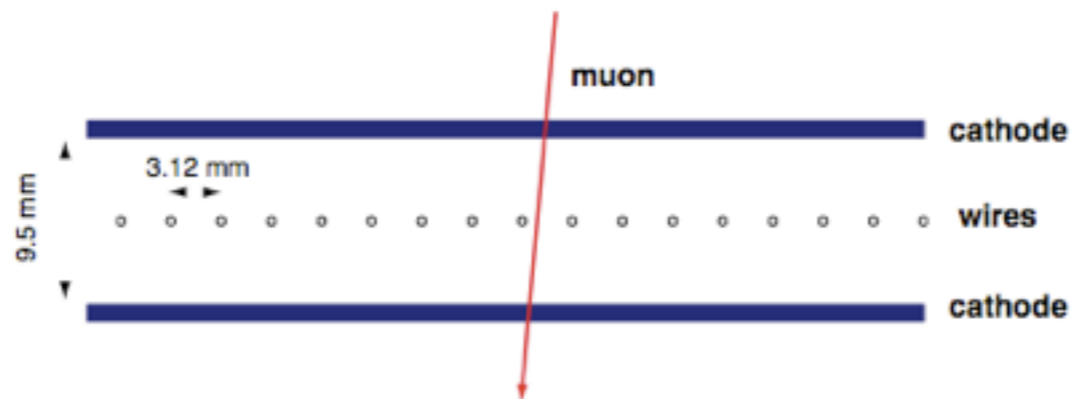


Fig. 1: Exploded 3D View of a Monitored Drift Tube



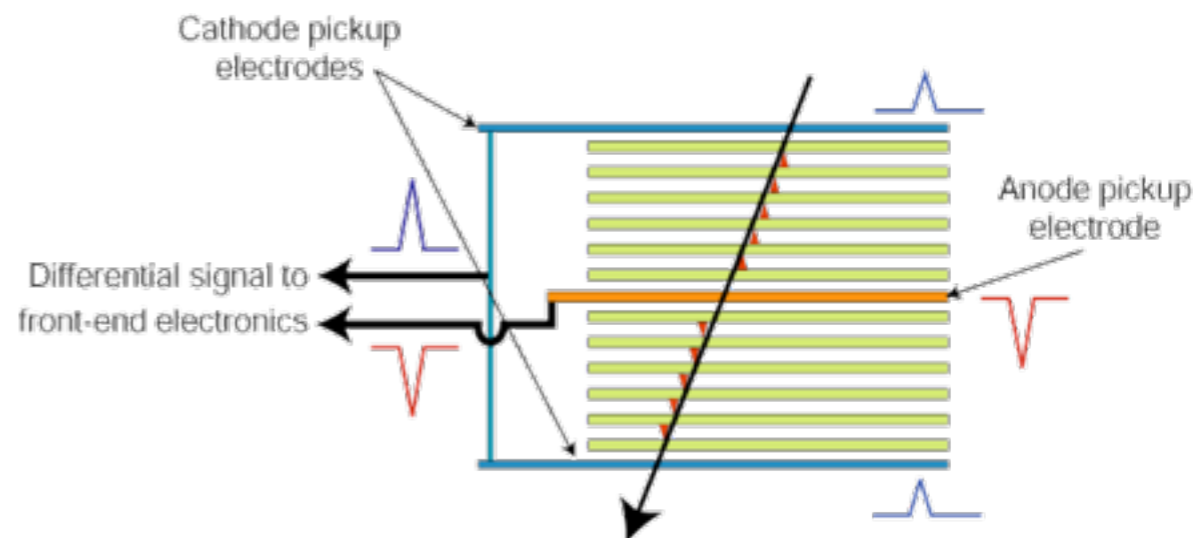
Thin Gap Chamber (**TGC**)
4 ns **Trigger**



Georges Charpak
Premio Nobel 1992

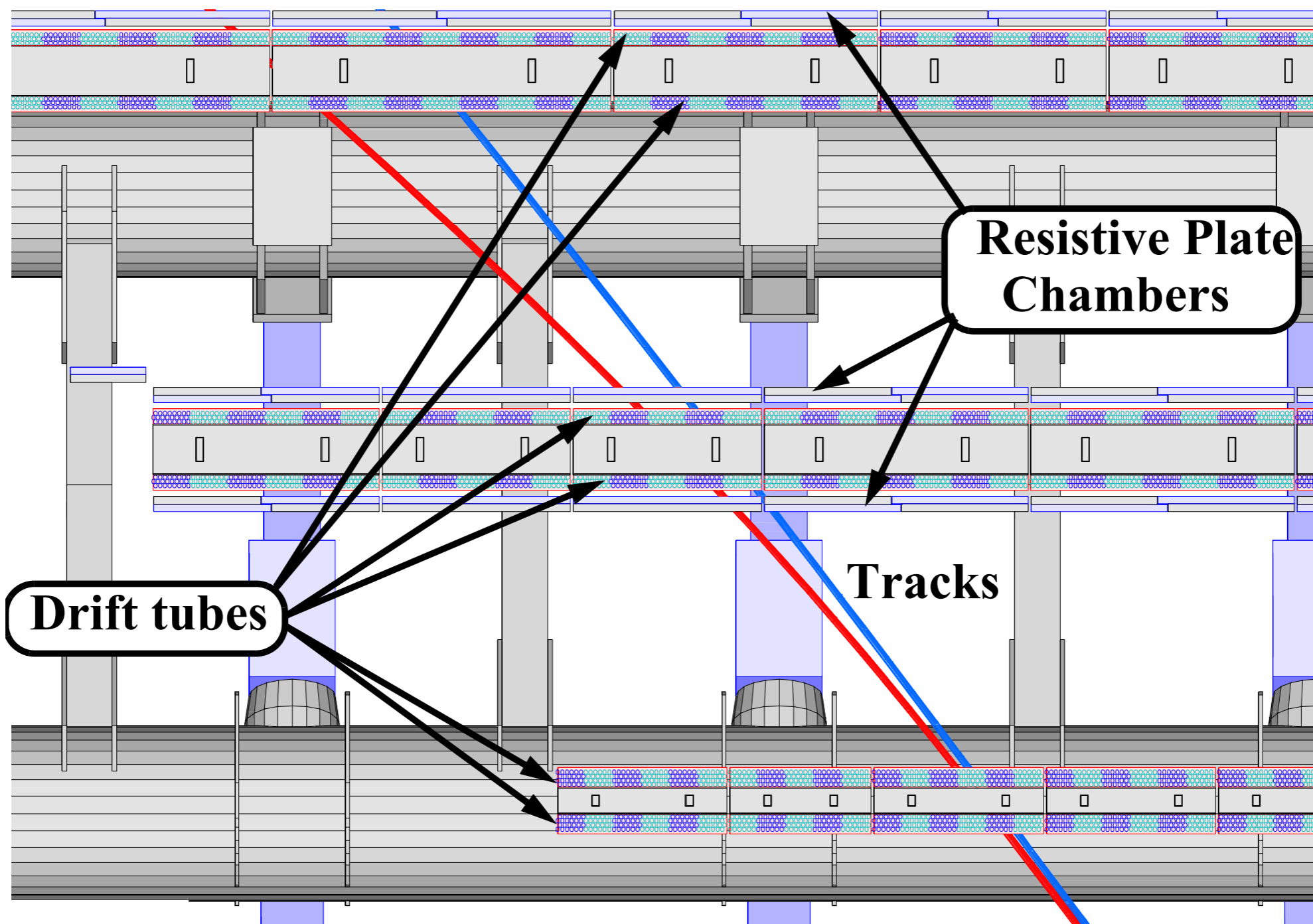


Monitored Drift Tube (**MDT**)
35 mm resolution
700 ns

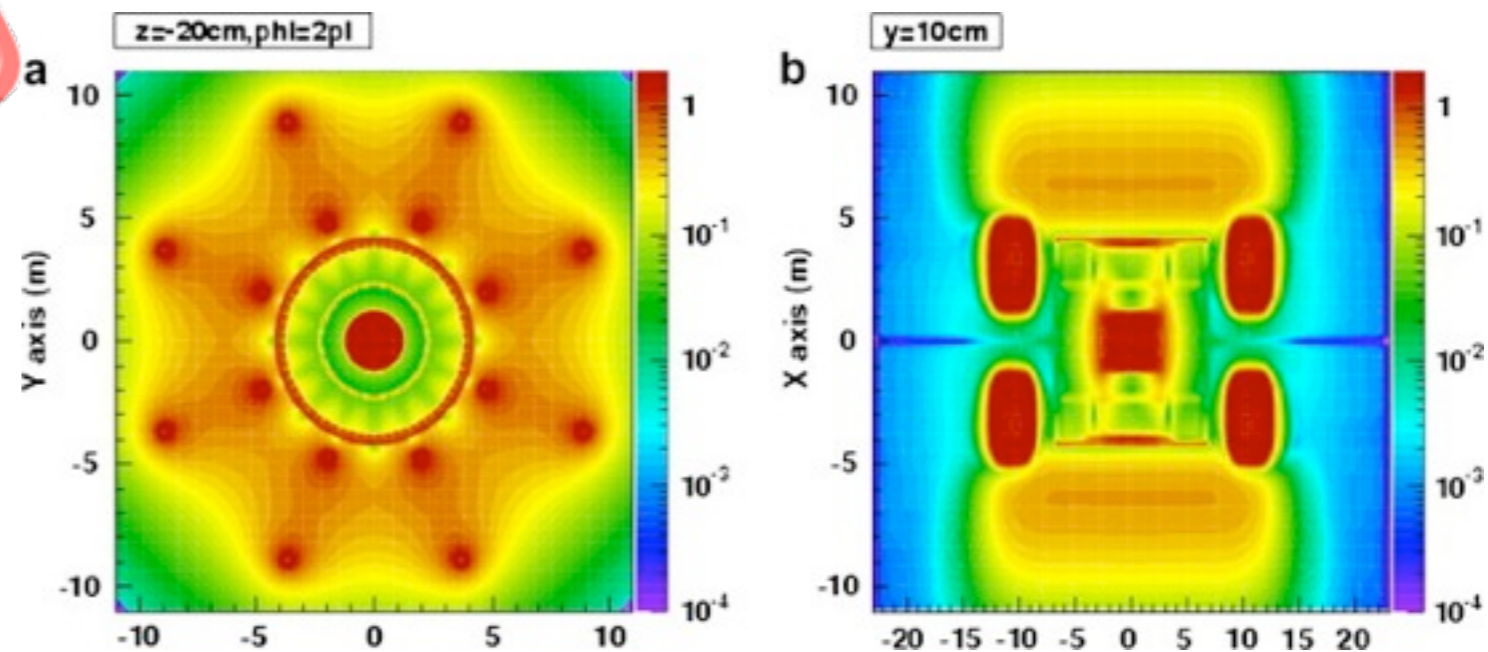
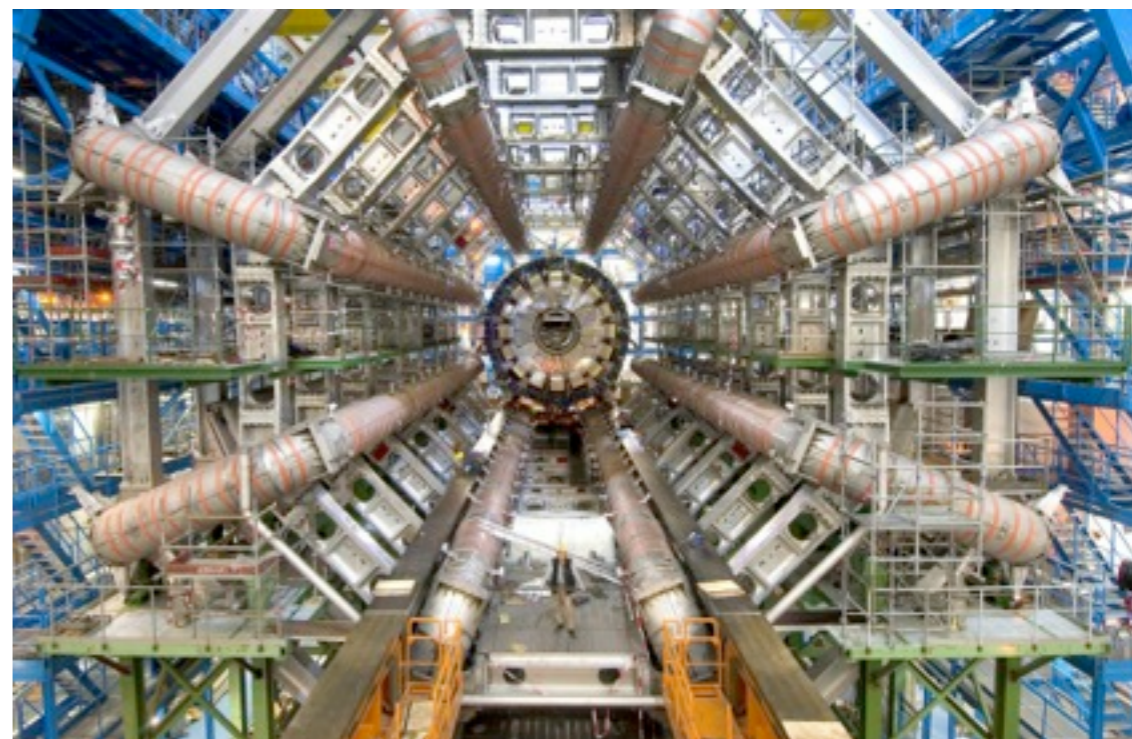
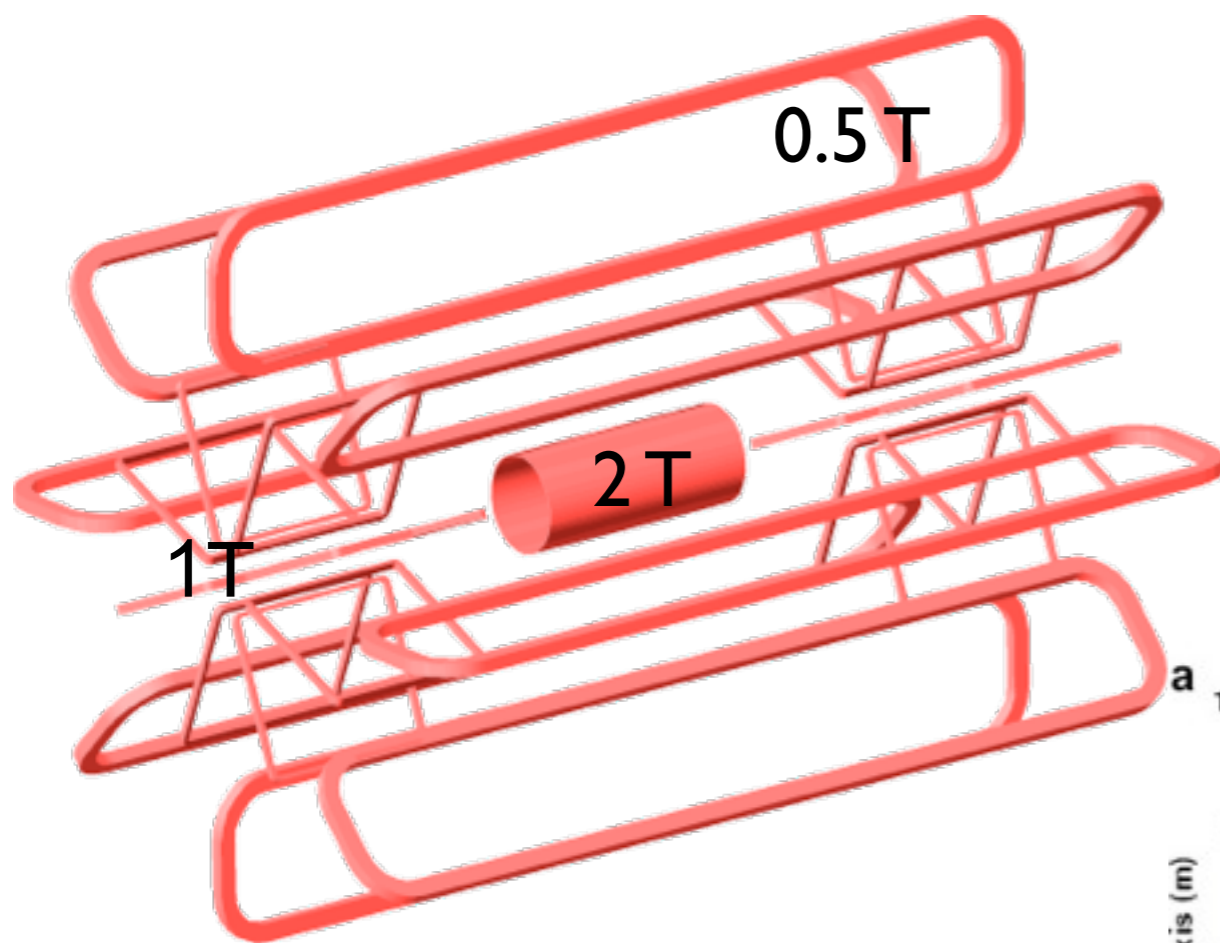


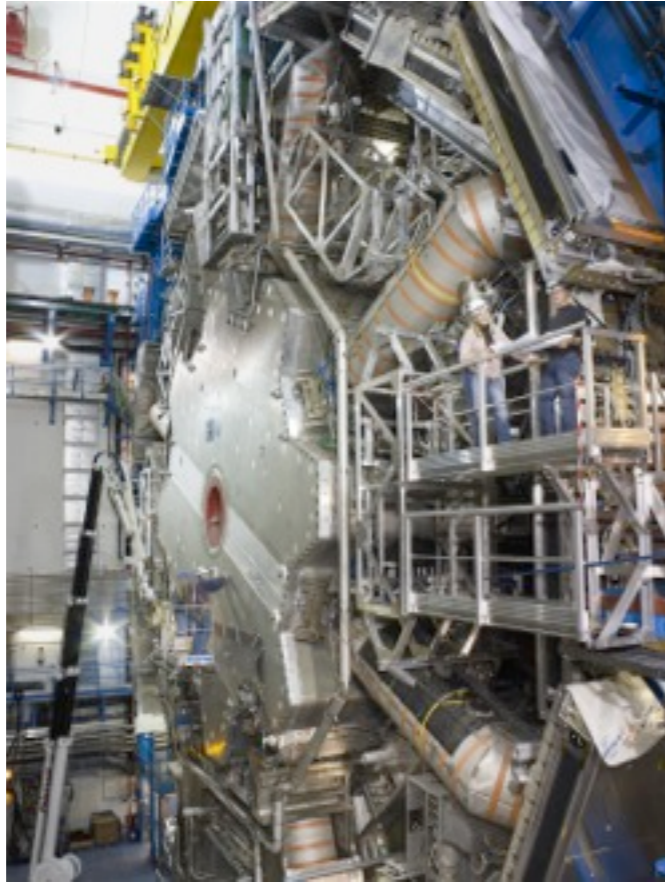
Resistive Plate Chamber (**RPC**)
1.2 ns **Trigger**

Espectrómetro de muones

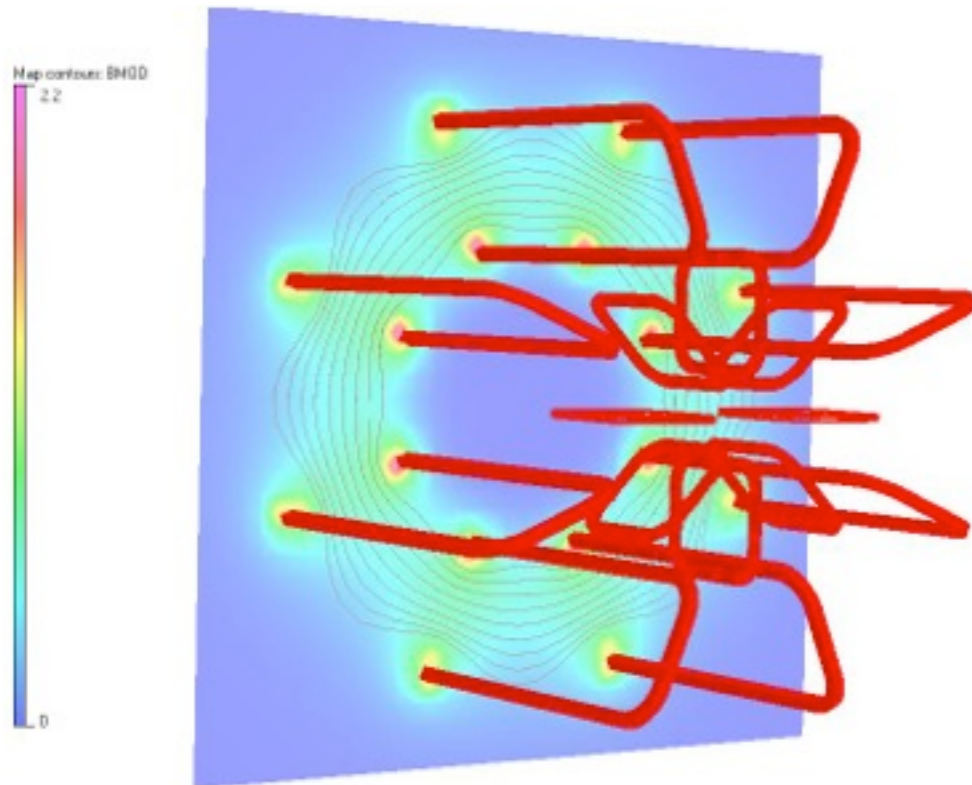
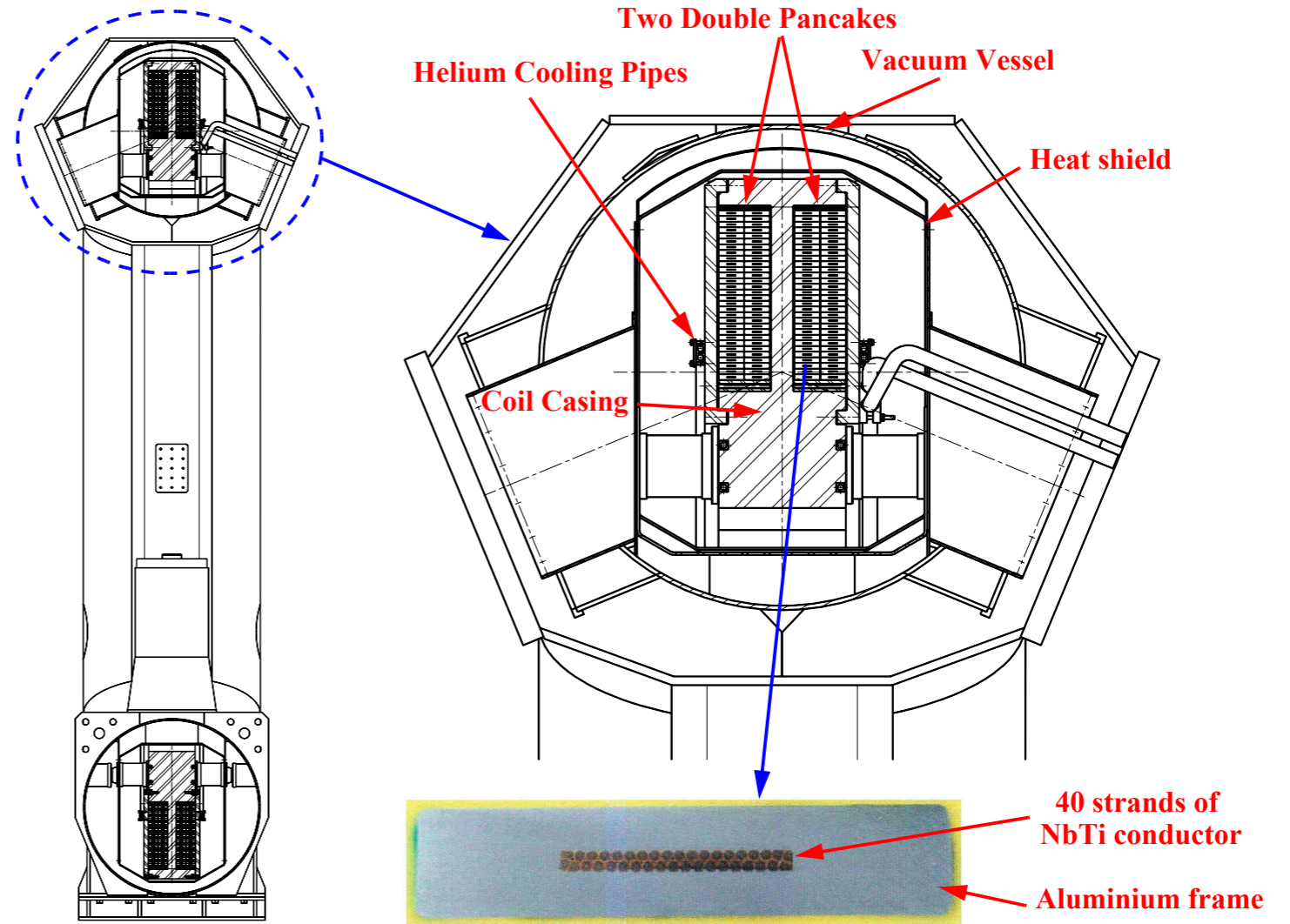


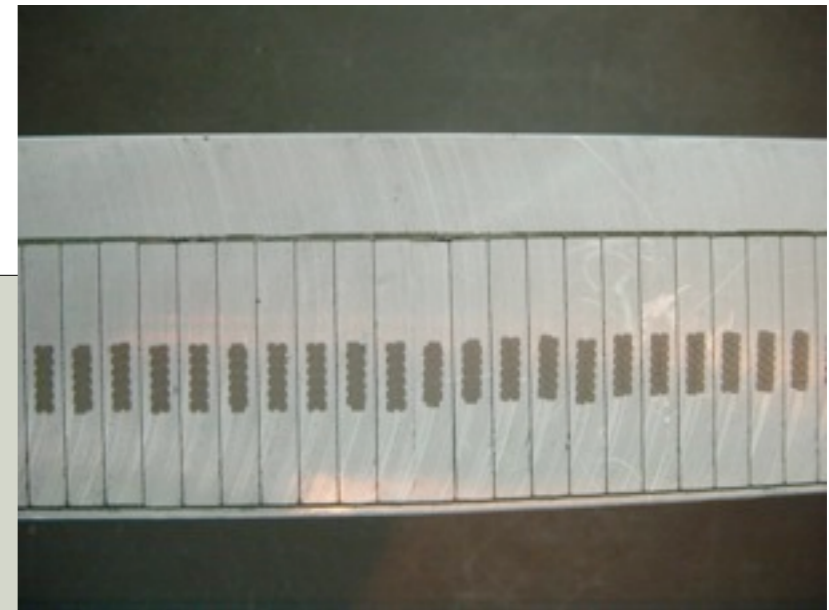
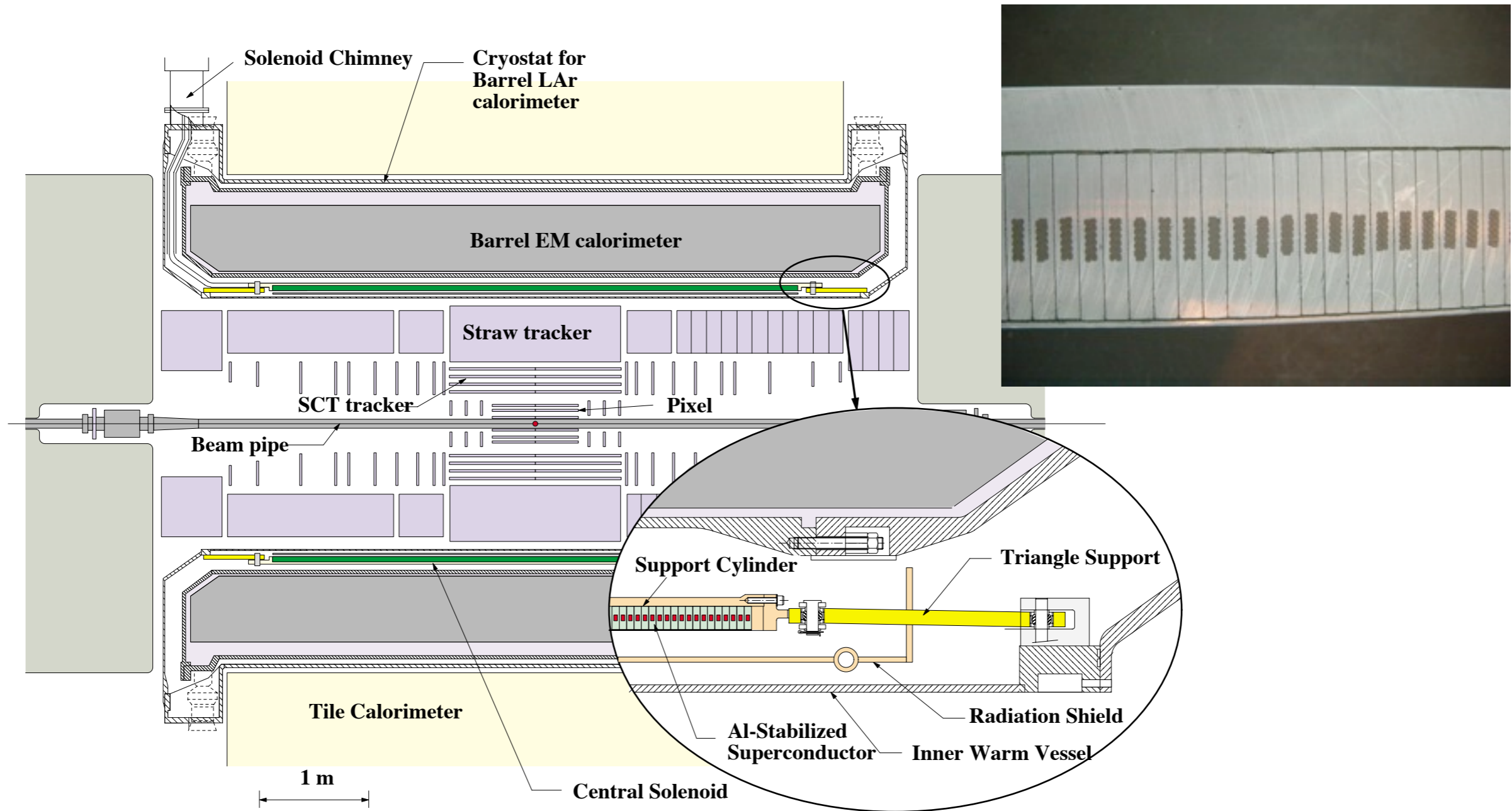
Campos magnéticos





Toroides

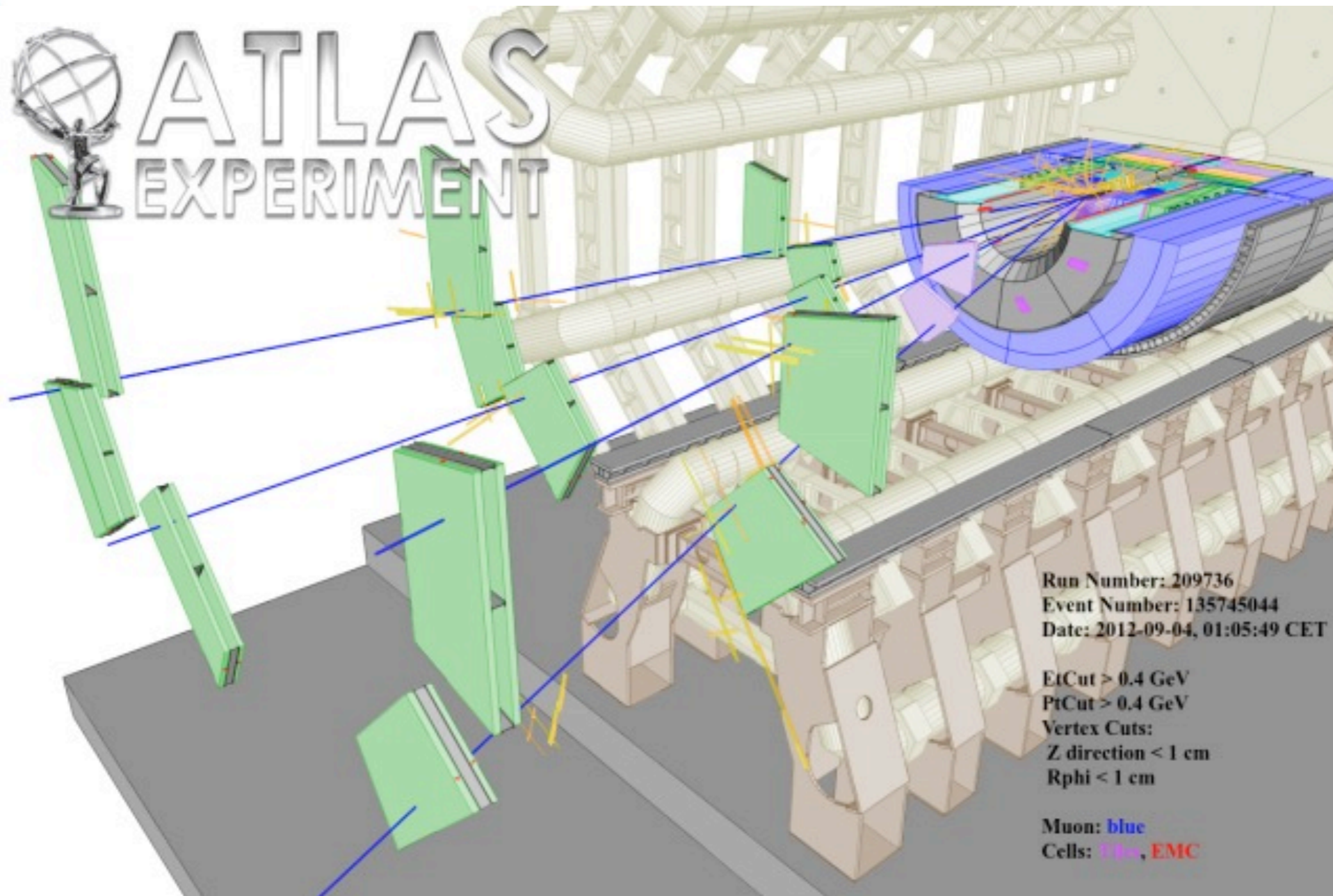




ATLAS Central Solenoid



Evento





Muchas gracias

garoe.gonzalez.parra@cern.ch



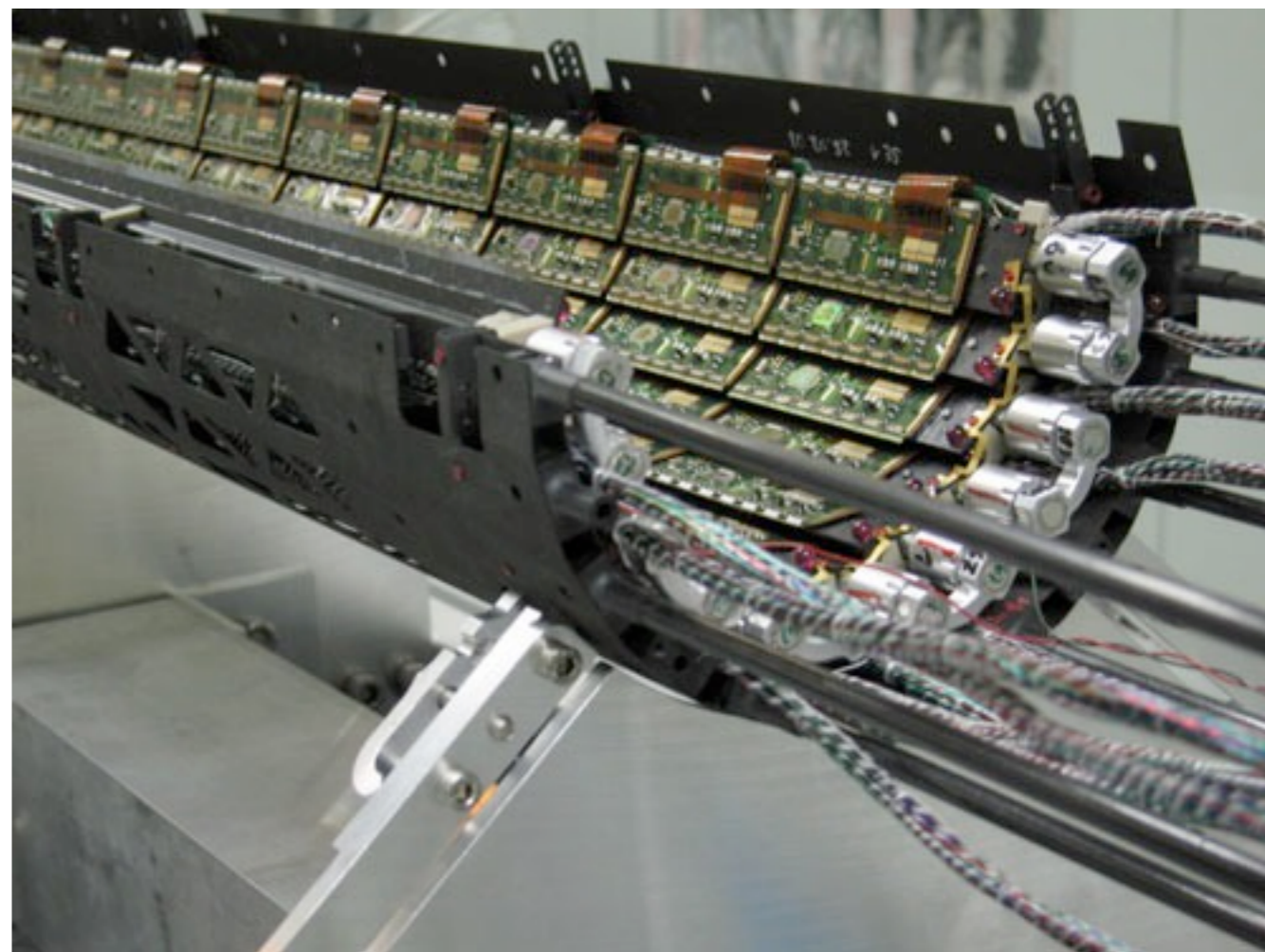
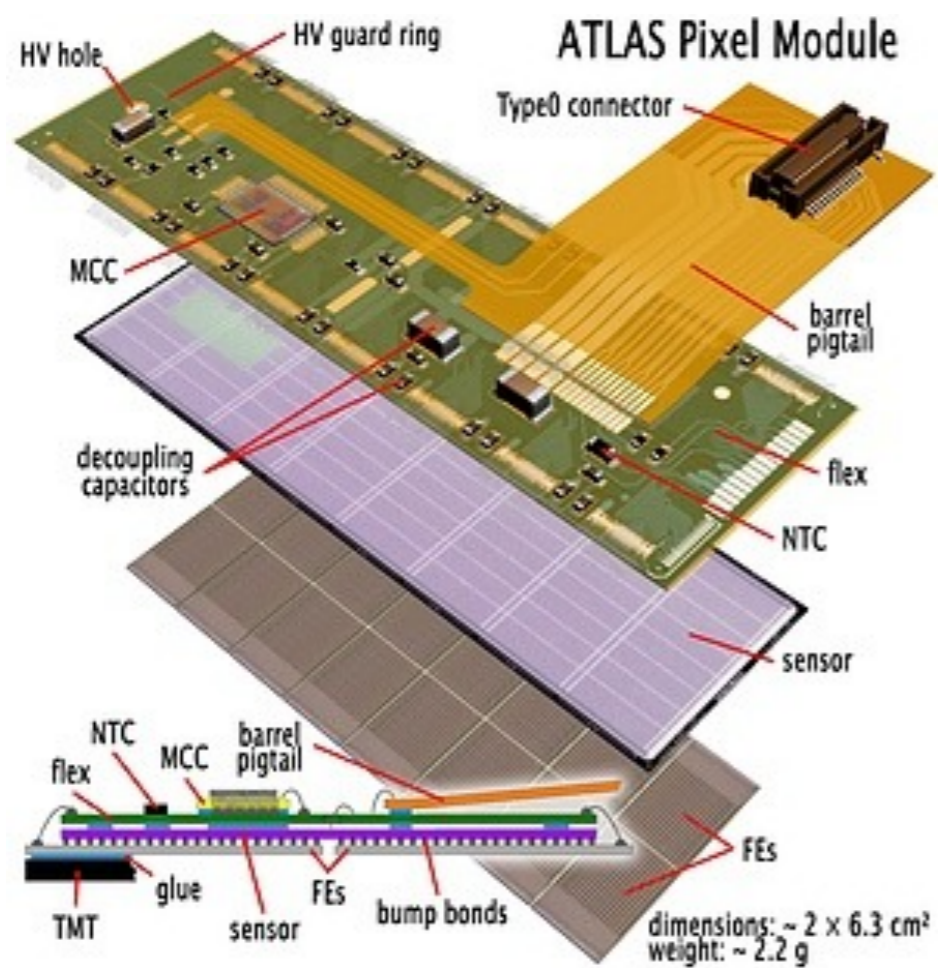
Diapositivas extra



Videos

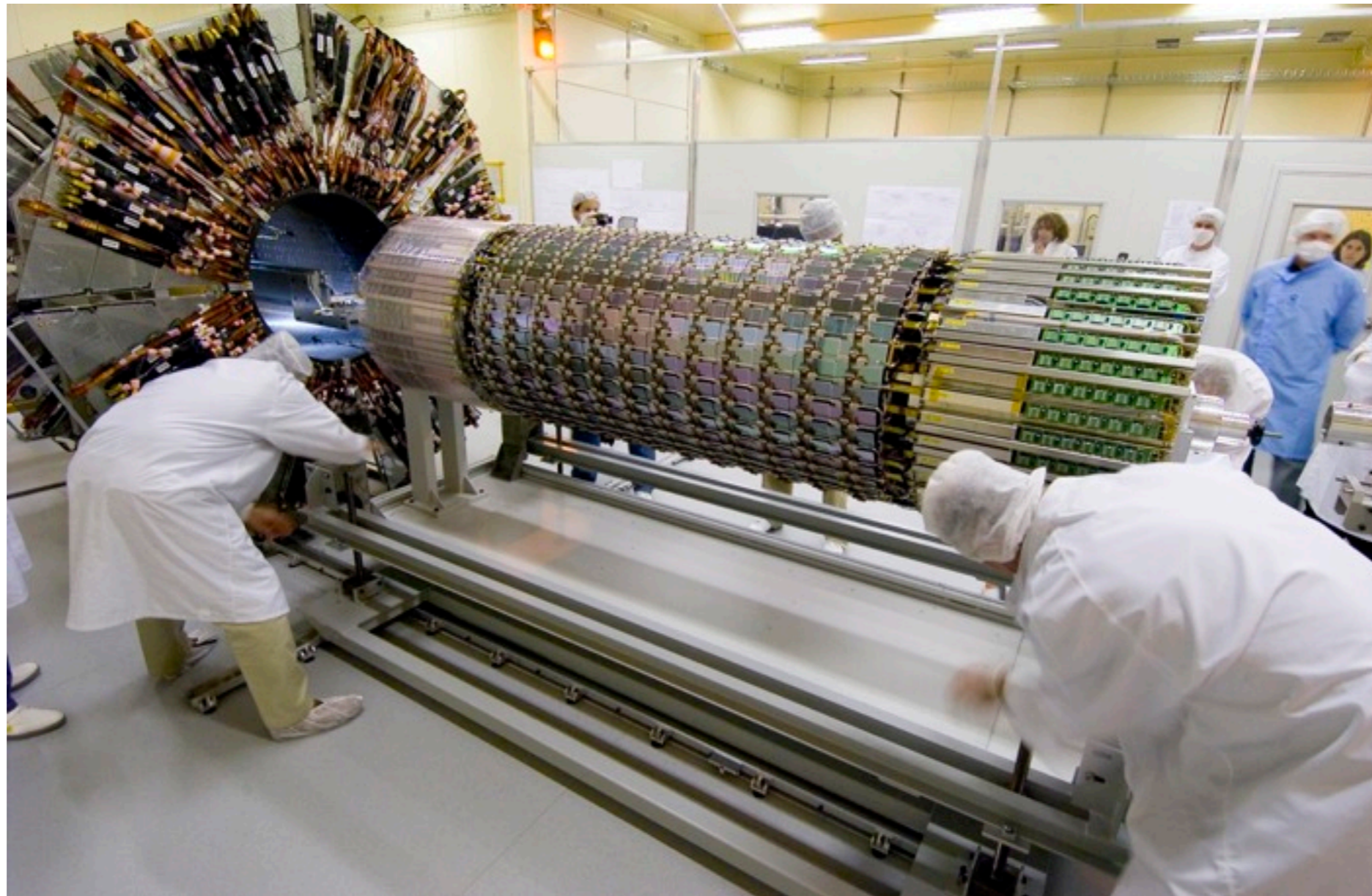


- <https://cdsweb.cern.ch/record/1406329>
- <http://www.atlas.ch/multimedia/#di-jet-event>
- <https://cdsweb.cern.ch/record/1228924>

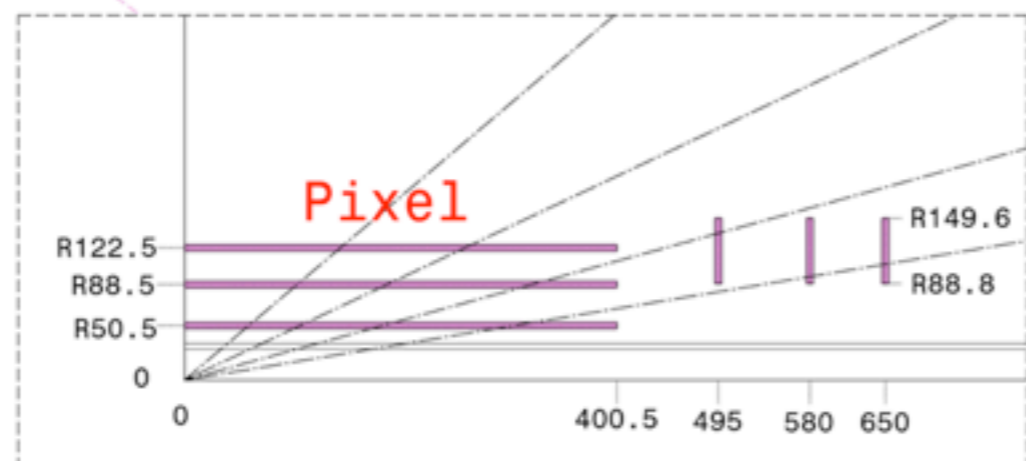
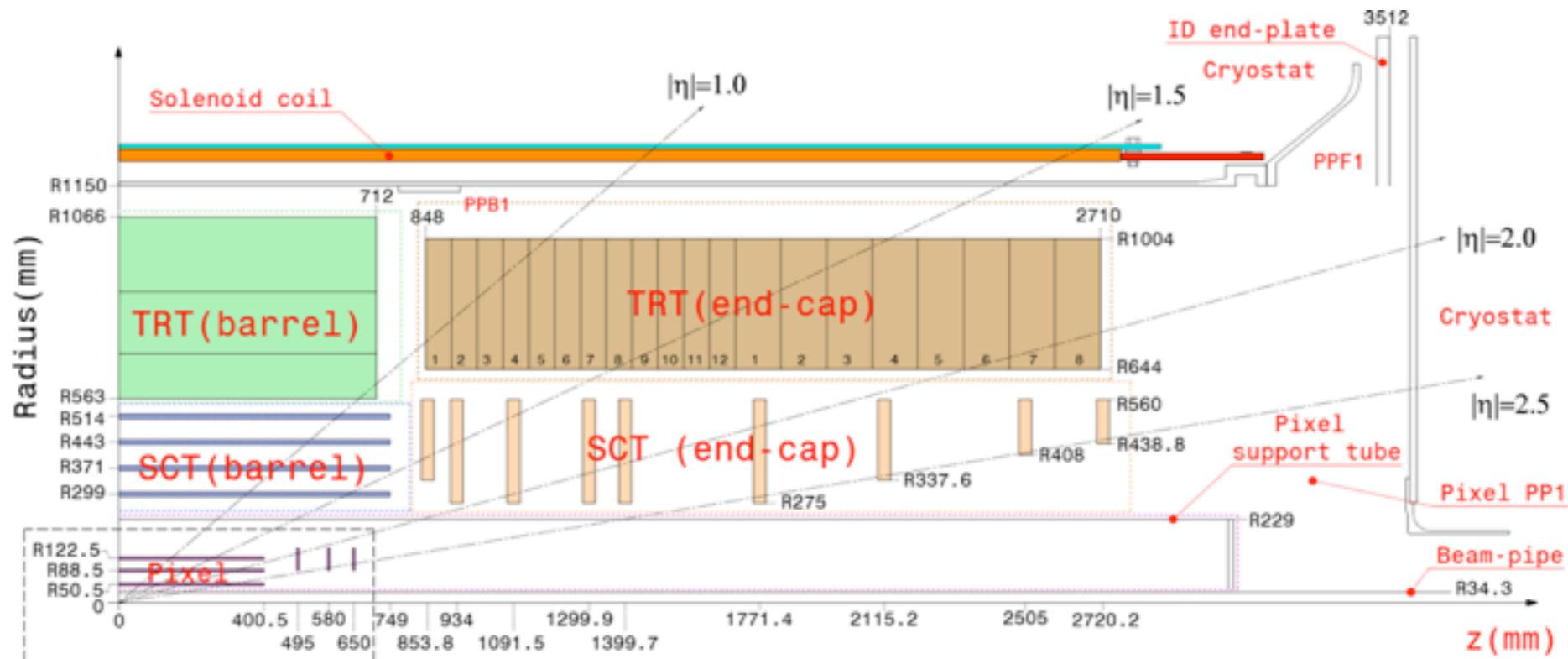


1744 módulos

TRT del detector interno



Detector interno



Envelopes

Pixel	-----	45.5 < R < 242mm Z < 3092mm
SCT barrel	-----	255 < R < 549mm Z < 805mm
SCT end-cap	-----	251 < R < 610mm 810 < Z < 2797mm
TRT barrel	-----	554 < R < 1082mm Z < 780mm
TRT end-cap	-----	617 < R < 1106mm 827 < Z < 2744mm

