

# Material Budget Imaging

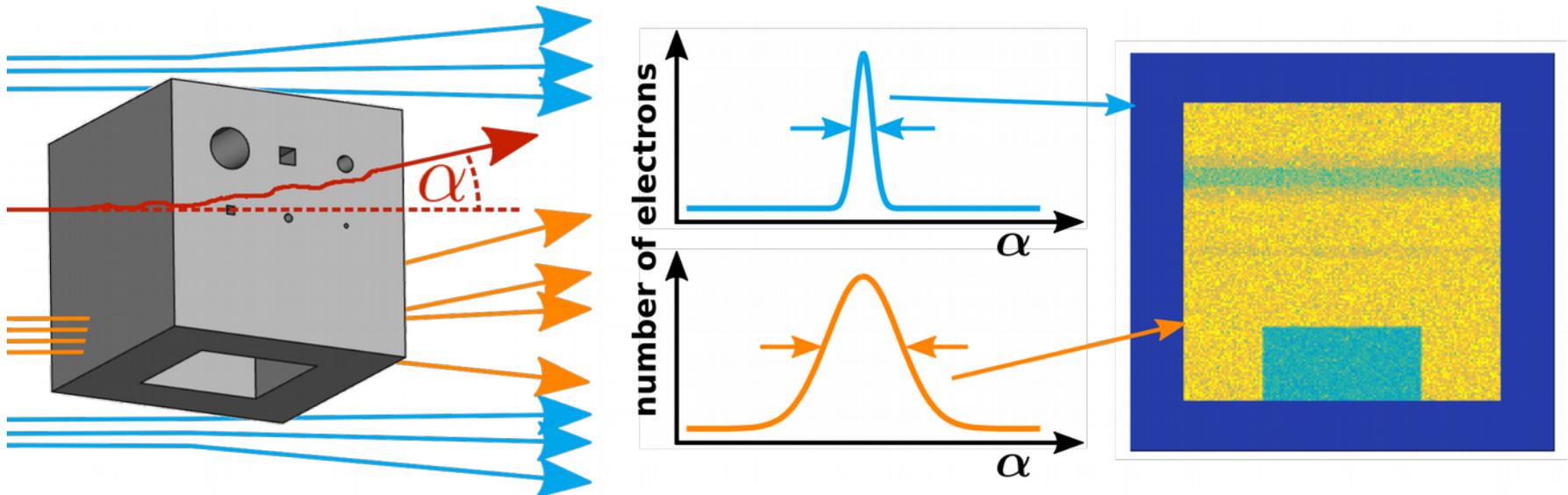
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- Material Budget:

- Amount of material:  $\varepsilon = \frac{x}{X_0}$
- Characteristic quantity for multiple scattering effects
- Important in High Energy Physics, especially in Detector R&D

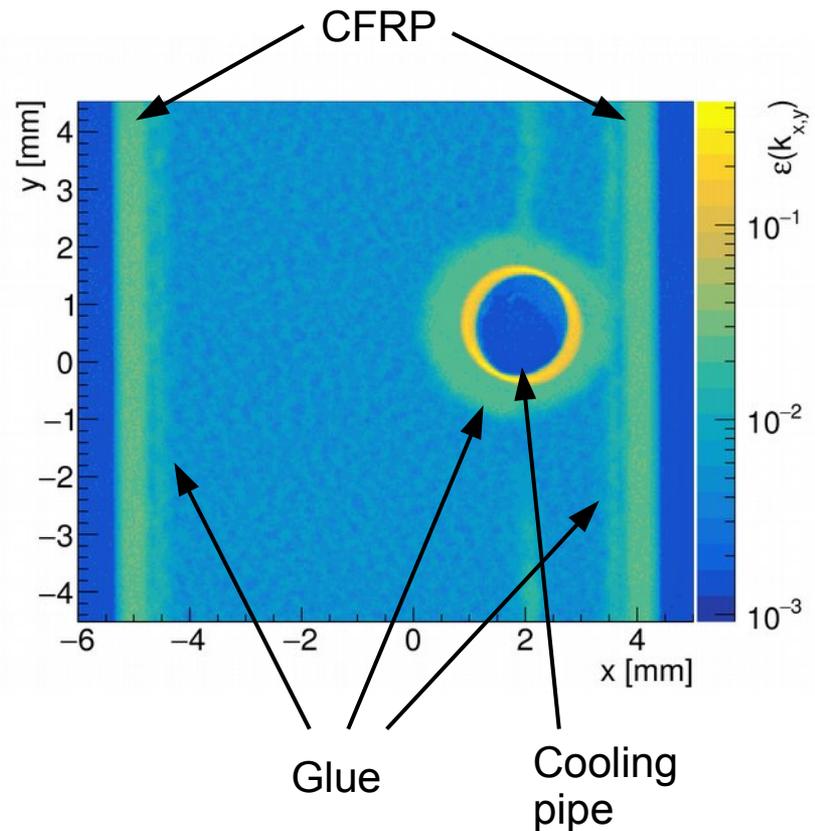
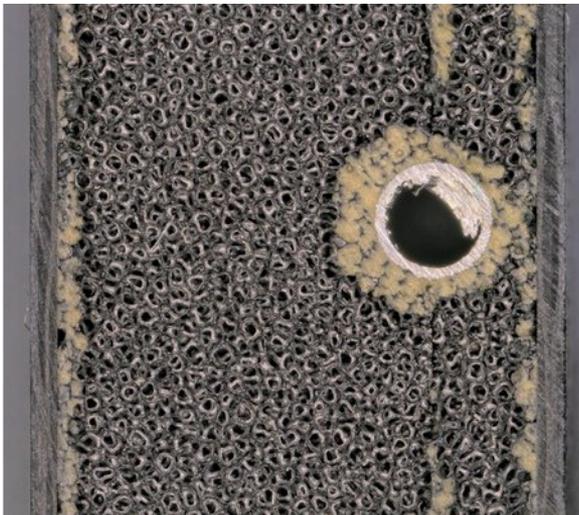
$\varepsilon$  : Material Budget  
 $x$  : Path length in the material  
 $X_0$  : Radiation length

- Goal: **Position-resolved measurement of the Material Budget of a Sample**



# Material Budget Imaging – 2D

- Example Material Budget image recorded at the DESY II Test Beam Facility
- Support structure prototype for the CMS Phase II Outer Tracker Endcap
  - Investigation on glue joint quality



# Material Budget Tomography – 3D

- Measuring projected Material Budget Images under different incidence / rotational angles
  - Tomographic reconstruction of the 3D Material Budget
- Example: Coaxial Connector
  - 180 projections measured

