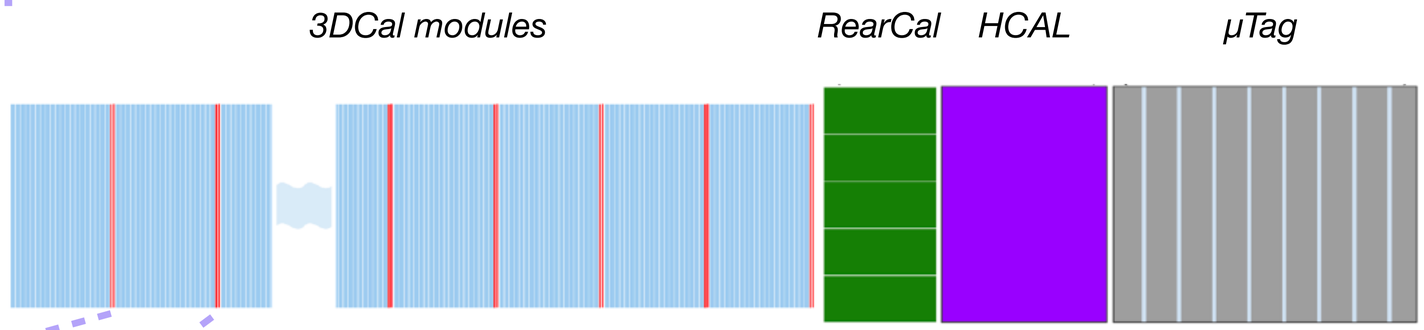
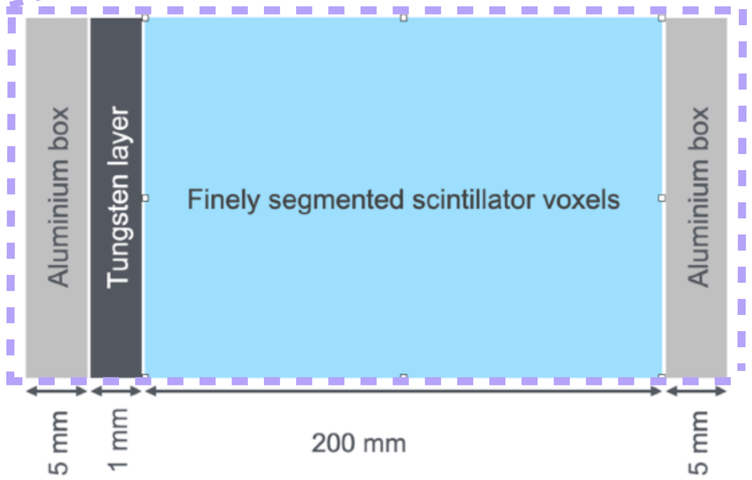
ForwArd Search ExpeRiment

FASERCal Detector Conceptual Design



Proposed Solution: *FASERCal*

- Fully electronic 3D Precision Calorimeter for High Energy Neutrinos, and sub-detectors. (A. Rubbia et al)



- **10 3DCal modules (520 kg):** each with 20 layers of 48x48 3D scintillator voxels → calorimetric information and tracking.
- **RearCal**: sampling calorimeter to enhance EM shower containment + energy measurement.
- **HCAL**: sampling calorimeter for hadronic energy measurements.
- **μTag / spectrometer**: dedicated detector for muon measurement.

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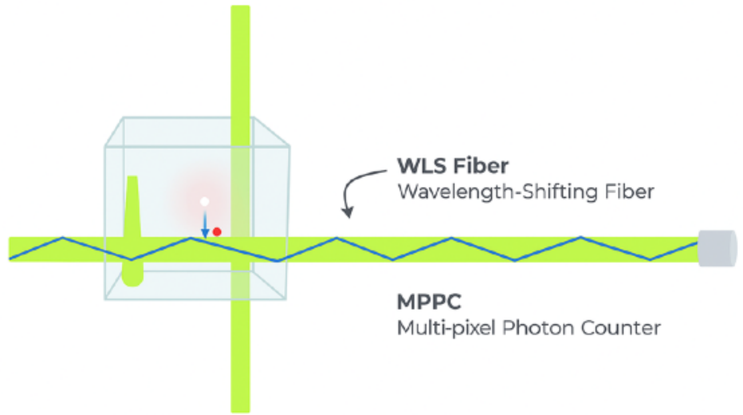
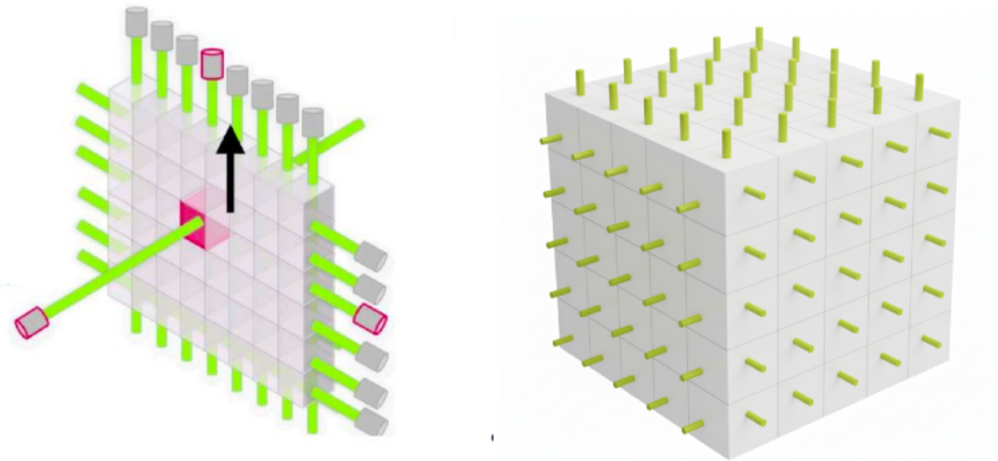
3DCal Modules

- **The Basic Unit - Scintillating Voxel:**
  - Detector built from half a million of **1 cm³ plastic cubes.**
  - A **charged particle crossing a cube** → cube scintillates, emitting photons.
- **Capturing the Light: Wavelength-Shifting (WLS) Fibers**
  - Three orthogonal fibers pierce each cube.
  - Fibers absorb scintillation light → re-emit & guide photons to sensors at detector edges.
- **Same technology as SuperFGD:**
  - Very Successful in T2K experiment.
  - 2 million voxels.





[The Super FGD for the T2K neutrino oscillation experiment: Link]