A (dime a dozen) Idea ?

Instead of mixing the Cherenkov and scintillation media in one block, consider making a *controlled sandwich* of the two.

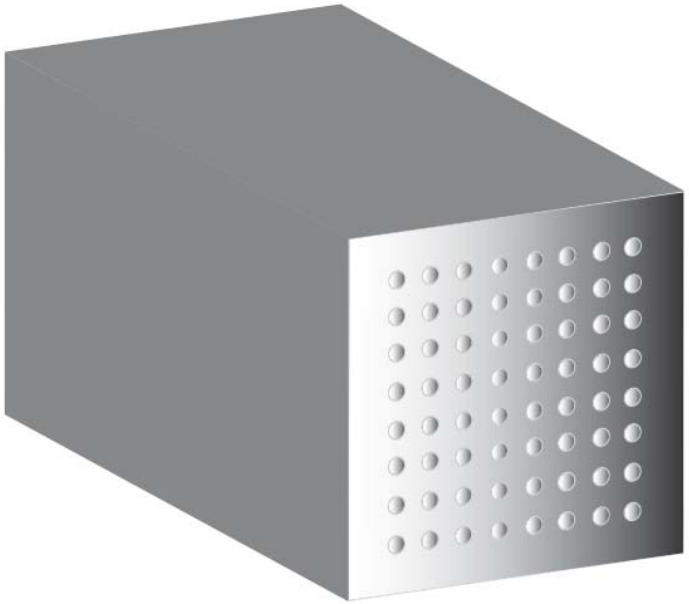
1. **Lead glass is both the absorber and the *Cherenkov* medium**
2. **Scintillating fibers or plates are the *Scintillating* medium**
3. **This approach removes light separation problems**

Various geometries are possible (but none is trivial).

1. **Lead glass rods of different shapes that can accommodate scintillating fibers are not hard to make**
2. **But it is not practical to make long (~meter) and thin (~mm) lead glass rods**
3. **It is possible to groove (~mm) lead glass plates**
4. **It is not practical to make large area (~m^2) but thin (~mm) lead glass plates**
5. **It is not possible to drill long (~10 cm) holes in lead glass**
6. **It is not trivial to "readout" lead glass absorber once it is embedded with scintillators**

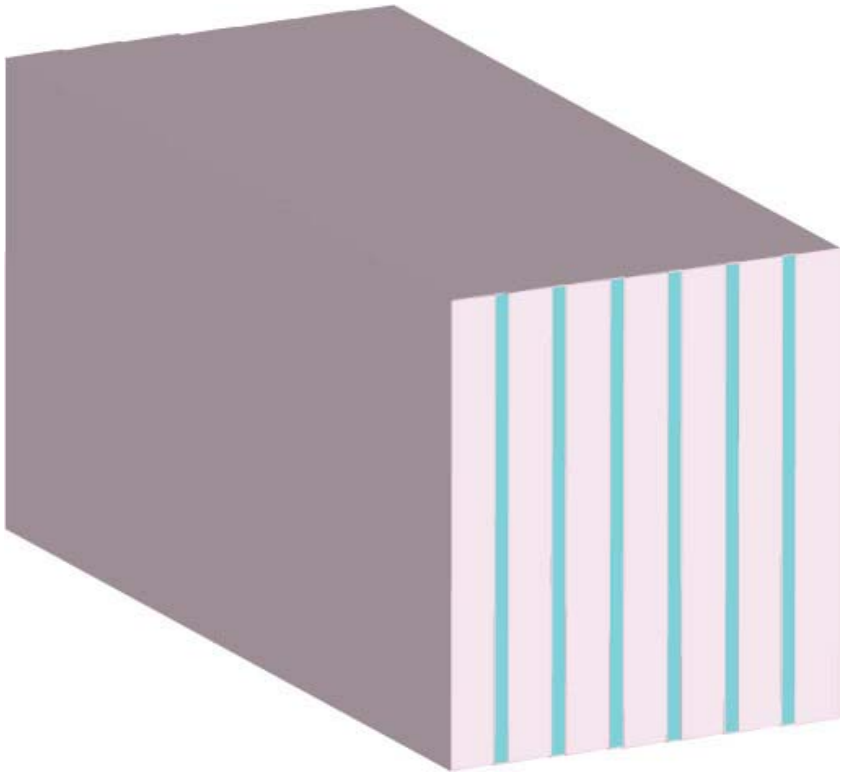
But it is worth investigating…

Scintillating Fiber + Lead Glass “Absorber”



Scintillating fibers are bundled and terminated at a photodetector behind the calorimeter.
Lead glass is readout by placing a large “PMT” in the back? Mount APDs? Hard problem…

Lead Glass “Absorber” + Scintillating Plates

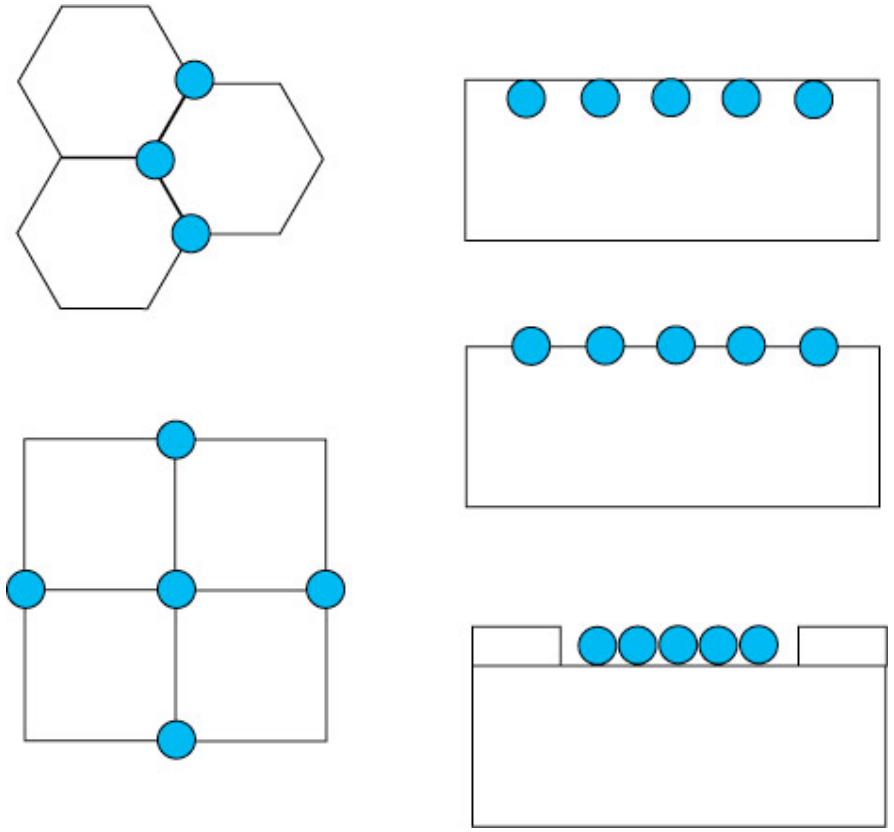


Scintillating plates are readout with WLS fibers and the light is guided to photodetector.

Lead glass is readout by photodetectors through shaped (solid or air-core) light guides.

Difficult and crowded arrangement at the back of the detector.

Possible Shapes?



There are infinite possibilities but we must consider the relevant scaling factors (*e.g.* Moliere radius in transverse and radiation/interaction length in longitudinal directions) and weight them against practical limits.

Blue is scintillating fiber and clear shapes are lead glass.