

Electromagnetic Calorimeter with good timing and directionality:

(with KOPIO in mind, but general)

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Shashlik design: absorber plates alternating with scintillator plates,

read with longitudinal WLS fibers to conventional PMTs $\sigma(t) = 90\text{ps}$ claimed

For $K^0 \rightarrow \pi^0 \mu\mu$ need to reconstruct photons and so π^0 as well as possible.

Possible concept (only: not developed)

Scintillator + WLS \rightarrow Cherenkov (prompt)

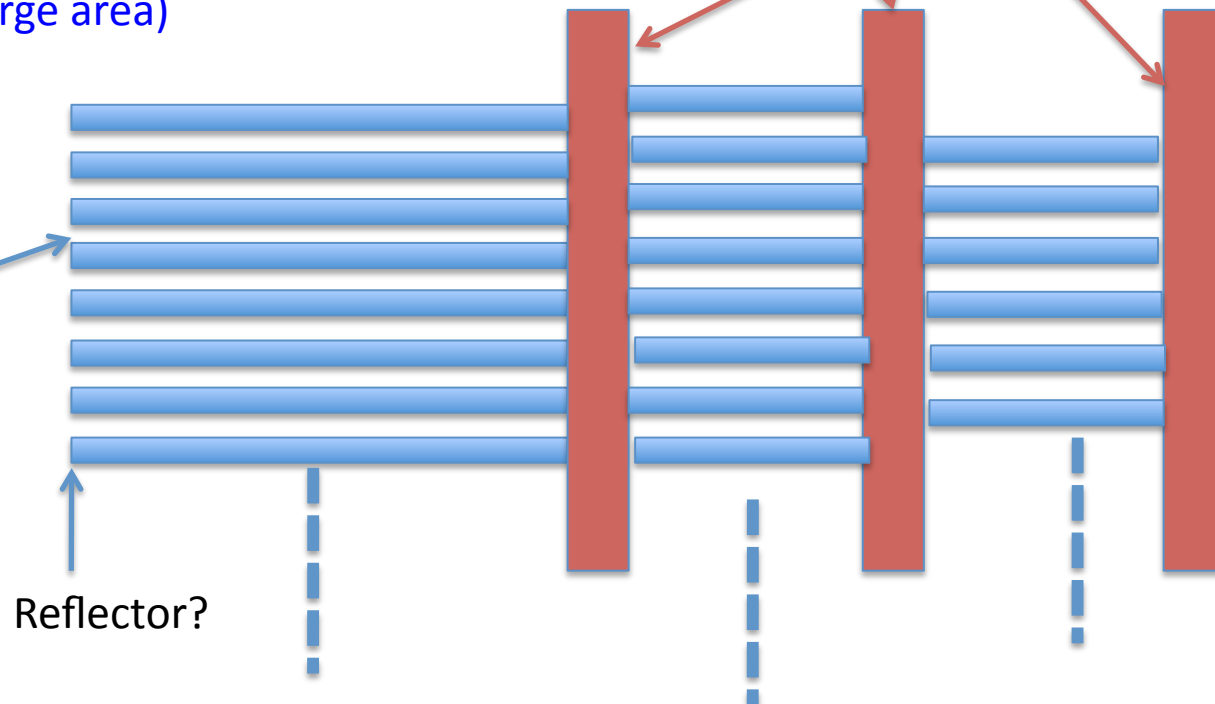
PMT \rightarrow MCP-PMT (large area)

Large area (20cm x 20cm)
MCP's (ACF project)

Quartz rods
(round, square,
triangular,..
Isolated for TIR
(minimal support)

Embedded in metal
(e.g. Pb) matrix

Reflector?



Electromagnetic Calorimeter with good timing and directionality:

Pb matrix: $X_0(\text{Pb}) = 0.56 \text{ cm}$. $X_0(\text{W}) = 0.35 \text{ cm}$.

Quartz: $X_0(\text{Q}) = 12.3 \text{ cm}$

If 75%-25% $\langle X_0(\text{W}) \rangle \sim 3.4 \text{ cm}$

Section 1 = $3 X_0 \sim 10 \text{ cm}$

Section 2 & section 3 = $2 \times 3 X_0$: Total $\sim 30 \text{ cm}$

**Measure EM shower profile
& centroid and time
at (say) 3 depths in shower.
3D pointing. Time information,
probably $< \sim 20 \text{ ps? } 10 \text{ ps?}$**

Large area (20cm x 20cm)
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