The aerogel Čerenkov counter

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DIRAC’s requirement

Kaon-proton separation between 4-8 GeV/c
The aerogel counter

- Aerogel with $n=1.008$
- 14 liters (250 pieces)

- Aerogel with $n=1.015$
- 24 liters (248 pieces)
The pyramid design

- In blue: box design.
- In red: Pyramid design with 2 layers of thickness 2 cm.
- In green: Pyramid design with 2 layers of thickness 4 cm.

Simulation

n=1.05
The sandwich design

- A sketch of the sandwich design showing layers of Aerogel, PM, and Tetratex.
- A photo of the sandwich design
- A graph showing intensity vs. wavelength with points for TPB (88020), pT (86470), and Other WLS
- A note indicating that only aerogel and POPOP (15150, 15080) are present
- A note indicating that n=1.05 for Npe
Summary

– The 3 counters are in “L”-configuration
– 6 PMs Photonis XP 4570R selected for high sensitivity in the UV-blue sector
– All 3 have the pyramid design
– The \( n=1.008 \) counter has the sandwich design
– Thickness
  - \( n=1.015 \): 147±7 mm  231±11 mm
  - \( n=1.008 \): 163.1±1.4 mm  233±2 mm
– Active area
  - \( n=1.015 \): 417±7 mmH x 166±2 mmW
  - \( n=1.008 \): 424±1.6 mmH x 159±0.6 mmW
Photos
Problems with the Magnetic field

pedestal

Signal ???

Top PM Panasonic
The magnetic shielding

Without B: Mean = 624
With B: Mean = 578

With mu-metal shielding:
• 92% efficiency for the top PMs
• 83% efficiency for the bottom PMs
Summary

• The counter is ready for the beam