



# *Lumi Status*

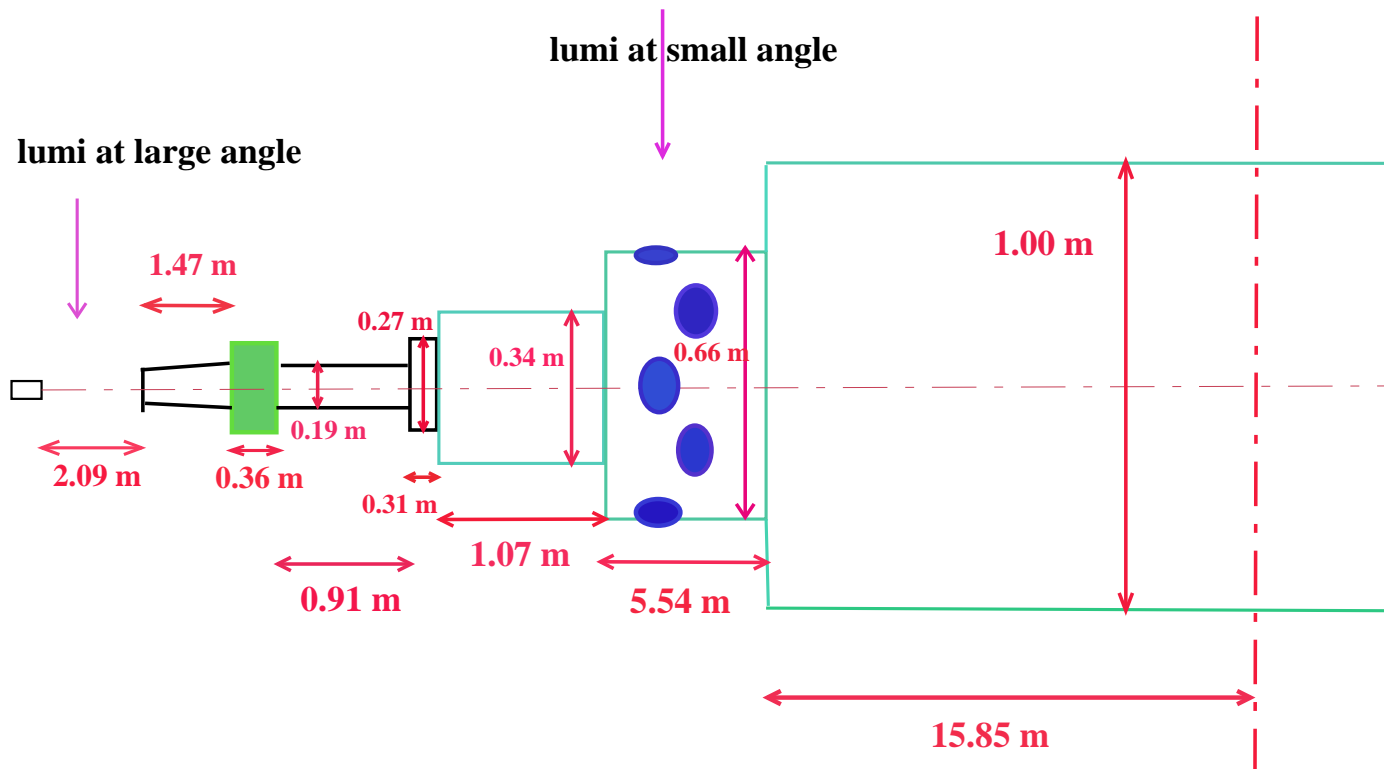
- *Lumi Setup*
- *Detector Lumi*
- *Target Lumi*

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# Lumi Setup

- **Detector Lumi** : 8 Lumi detectors at  $z = 7m$  and  $r = 6cm$  ( $\theta = 0.5^\circ$ ).
- **Target Lumi** : 2 Lumi detectors at  $z = 1m$  and  $r = 10cm$  ( $\theta = 6^\circ$ ).





## *Detector Lumi*

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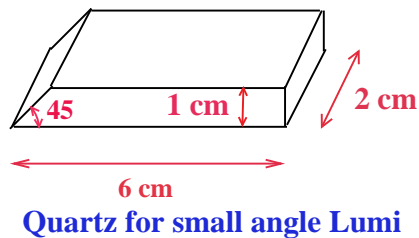
It has **3** major parts :

- Quartz
- Air Light–Guide
- Photomultiplier

# Detector Lumi

## 1. Quartz

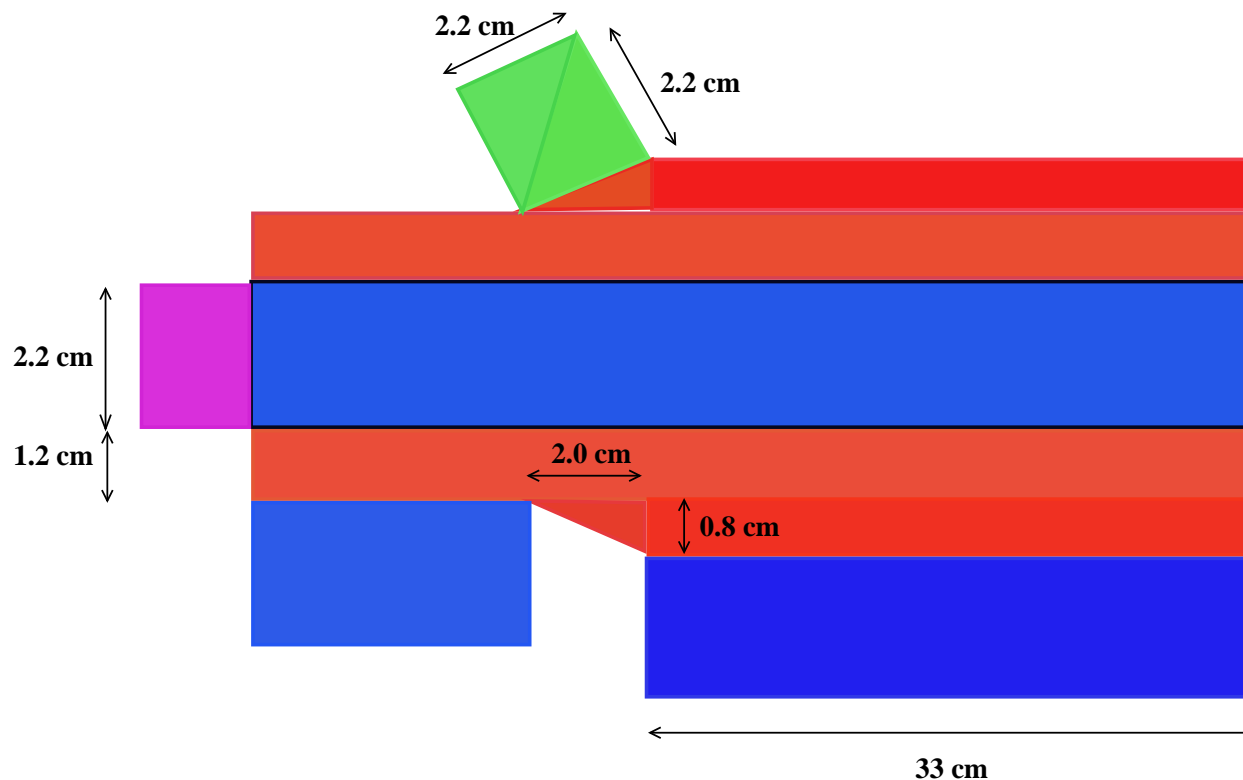
- Rectangular bar of Spectrosil 2000 standard optical polish on all 6 faces.
- Dimensions 1 cm  $\times$   $\times$  2 cm  $\times$  6 cm .



# Detector Lumi

## 2. Light Guide

- Material : Aluminium ( Anolux Miro IV PVD )
- Length : 40.5 cm long



# Detector Lumi

## Light Transmission Through Light Guide

-Total reflection :

$$\sin\Theta \geq \frac{n_{ex}}{n} = \frac{1}{1.475} \Rightarrow \Theta > 42.68^\circ$$

-Cherenkov light angle :

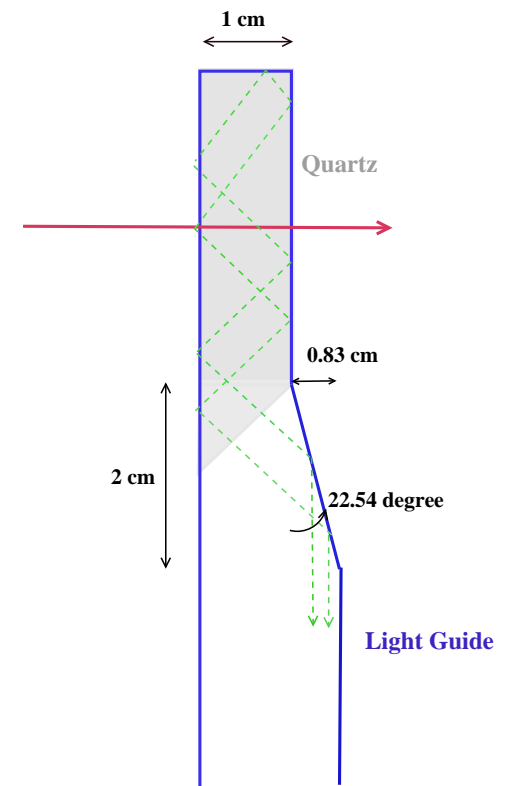
$$\cos\theta_{Cherenkov} = \frac{1}{\beta n}$$

$$\theta_{Cherenkov} < \cos^{-1}\left(\frac{1}{n}\right) = 47.3^\circ$$

-Threshold :

$$\beta_T = \frac{1}{n} = 0.68$$

$$\gamma_T = \frac{n}{\sqrt{n^2-1}} = 0.62$$





## *Detector Lumi*

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**Photodetector Detector** Two types :

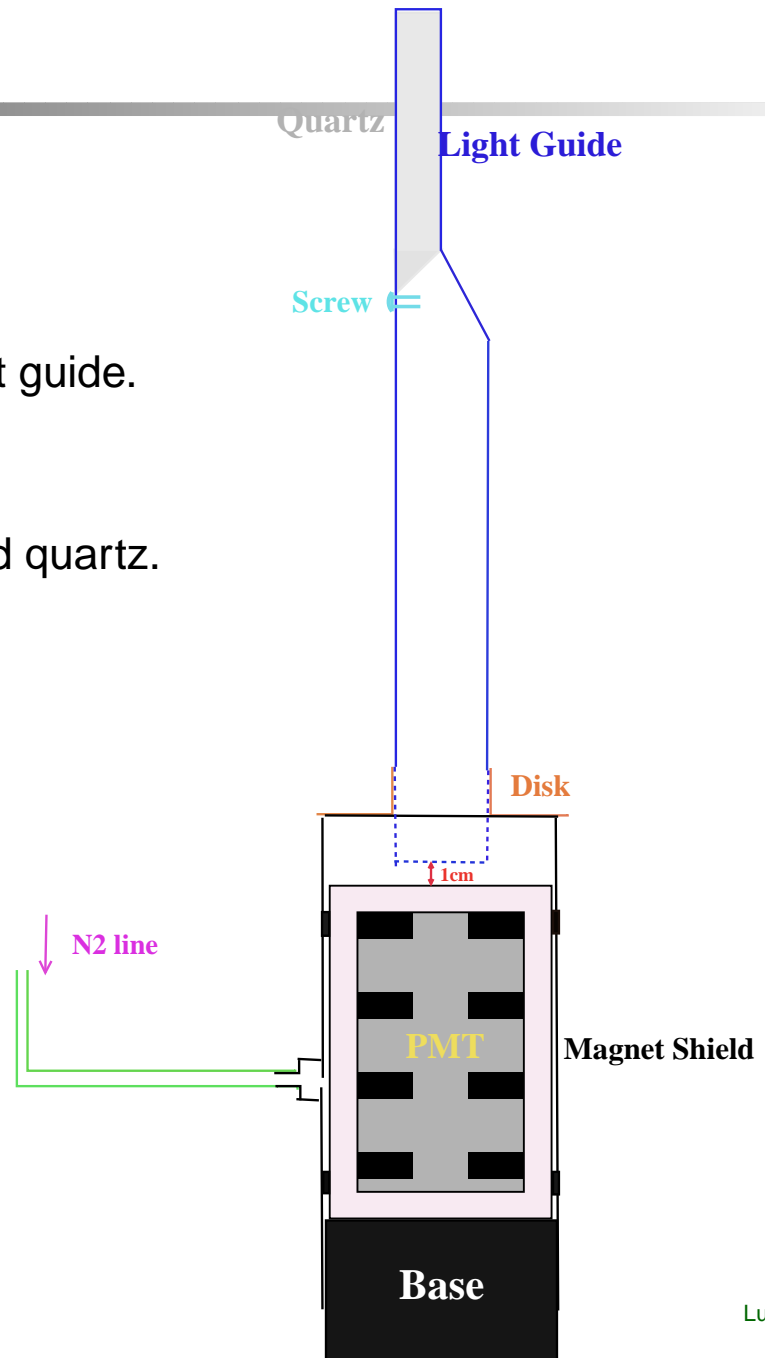
- R7723Q window ( this will be used )
- R7723UV glass window
- E5859-15MOD for the Base
- Magnetic Shield

-Quartz PMTs sensitive to He ( use  $N_2$  purge )

# Detector Lumi

## Assembly

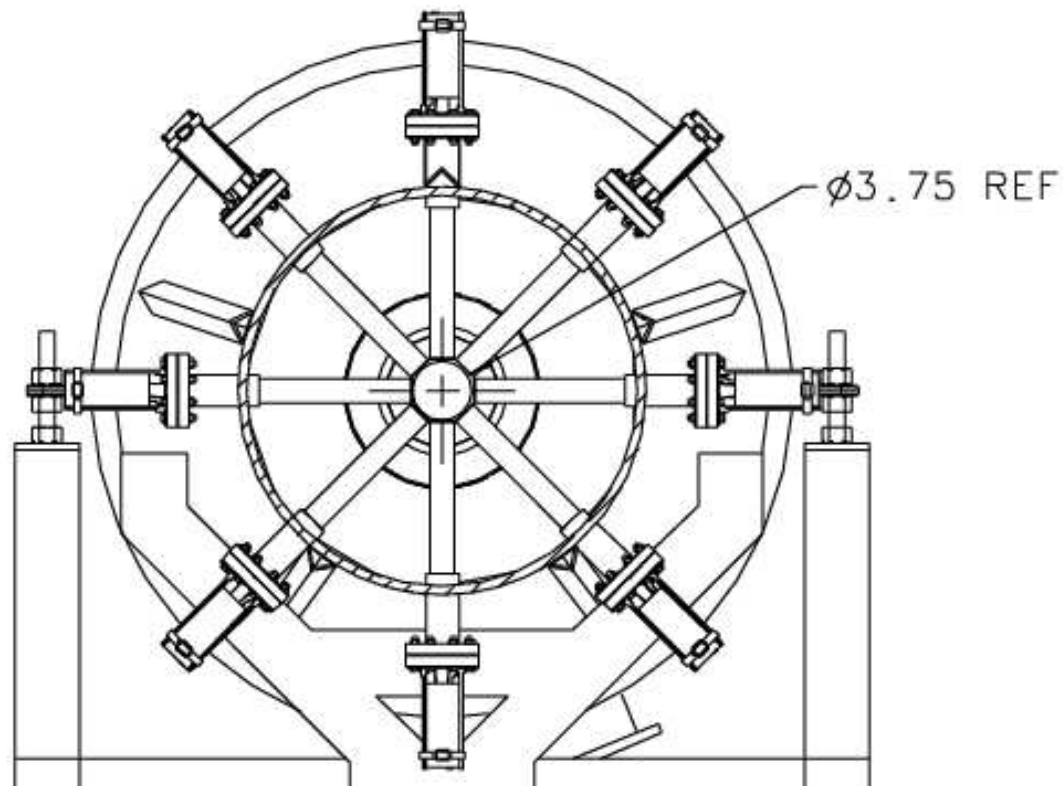
- Use a 3.5 cm disk with square hole ( 2.2 cm × 2.2 cm) to attach PMTs to light guide.
- $N_2$  line to flush PMTs.
- Brass screw with heat shrink on it to hold quartz.





## Detector Lumi

- Tubing with tees wrapped around the pipe with fingers to the PMTs.



## Target Lumi

- Quartz : dimensions 2 cm × 5 cm × 17 cm
  - Light Guide : length 57.5 cm
  - Lead Shield Around PMTs
- Measurement in the Hall to put the target Lumi

