

# ePIC pfRICH Aerogel QA Progress Report

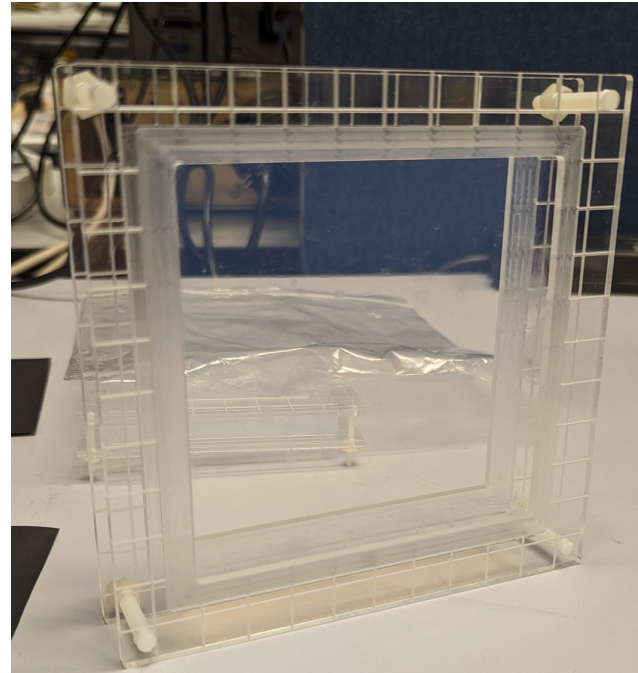
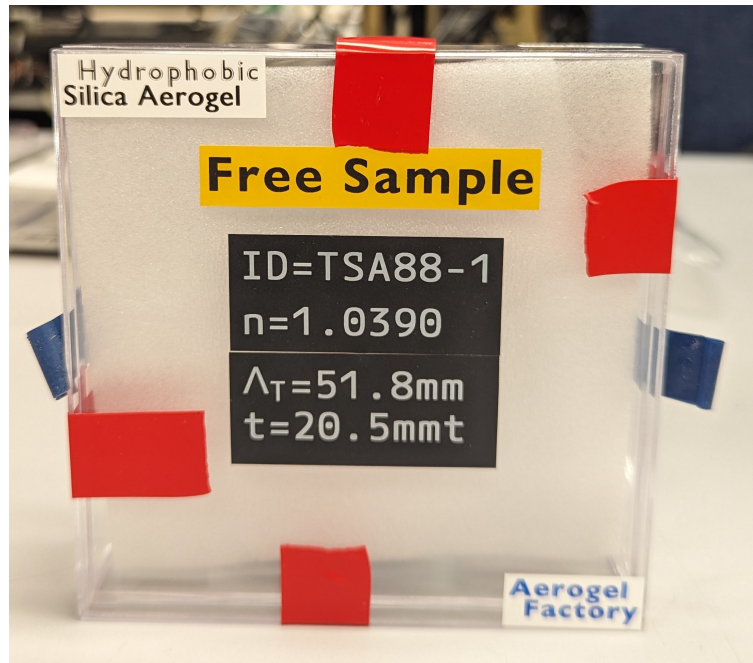
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Temple University

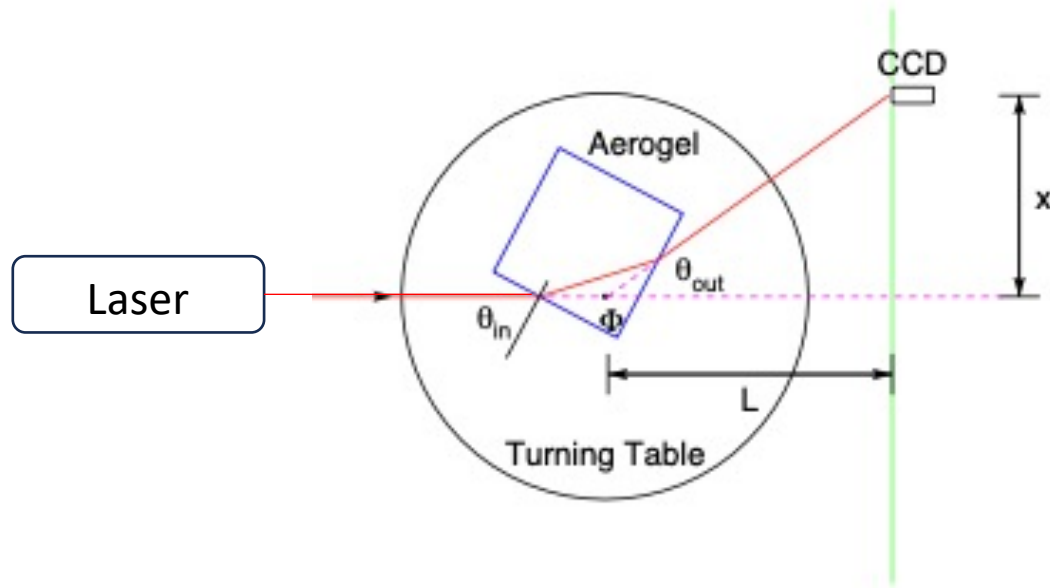
1. Aerogel Factory Co Aerogel Tile
2. Index of Refraction Measurements
3. BNL Monochromator Measurements

❑ Received first aerogel tile from Aerogel Factory Co., Ltd. Chiba Japan

- TSA88-1
- Dimensions (~11 cm x 11 cm x 2.05 cm)
- Tile looks much better visually than first two tiles from Tsinghua University, Beijing

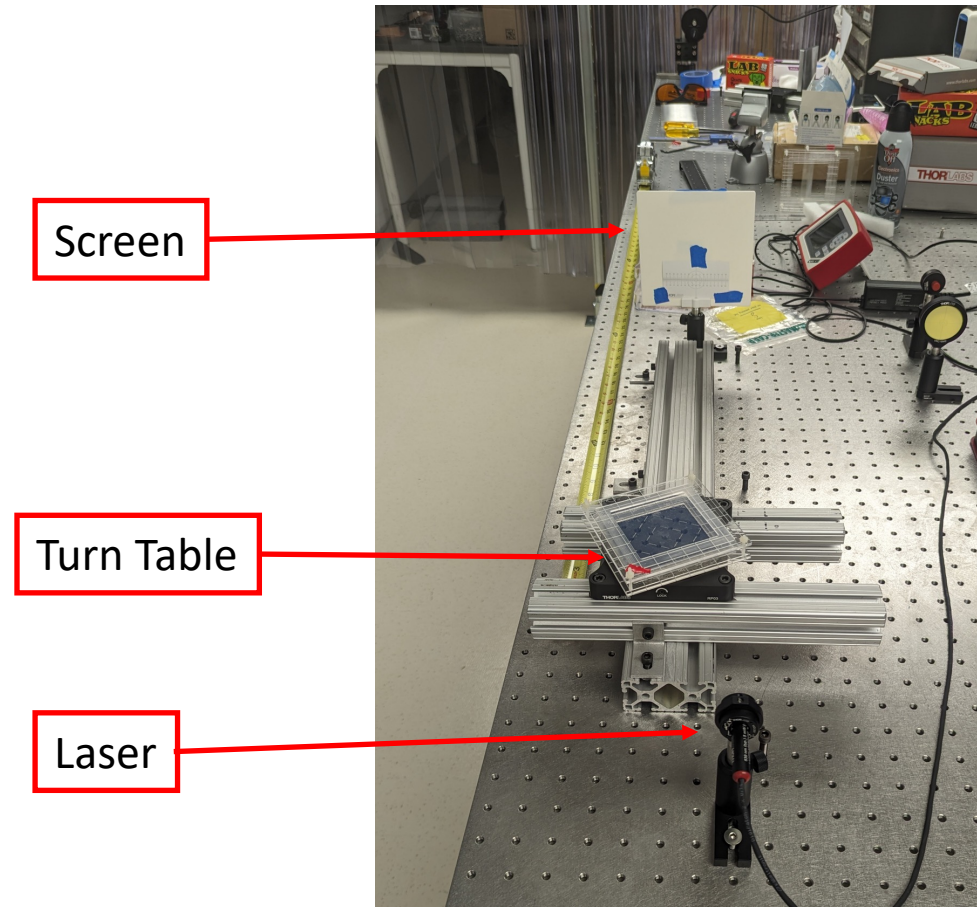


- Use prism method with two lasers (405 nm and 639 nm)

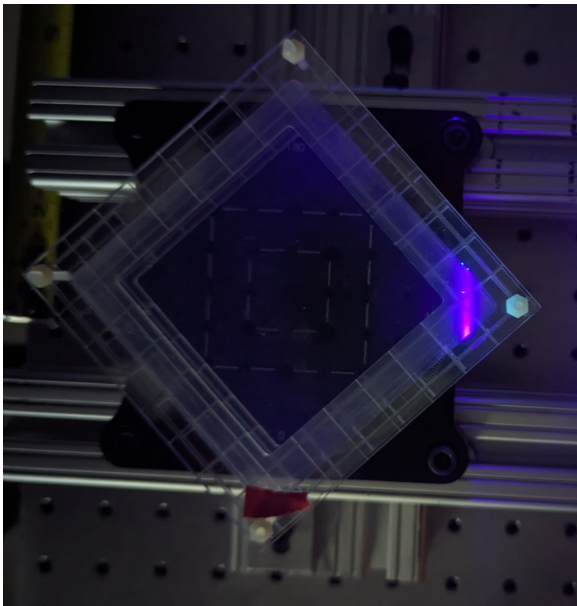
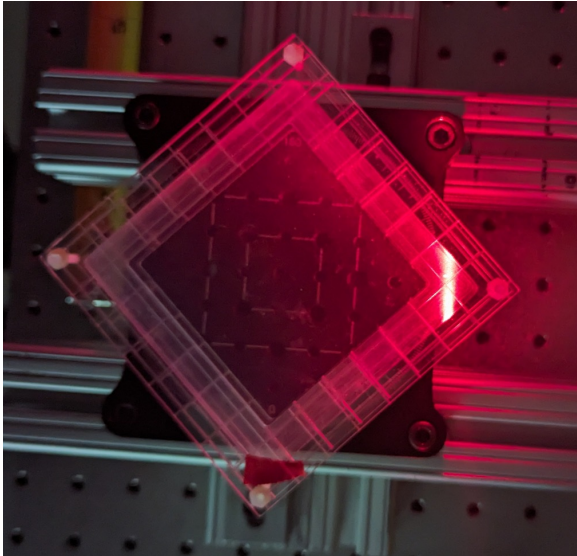


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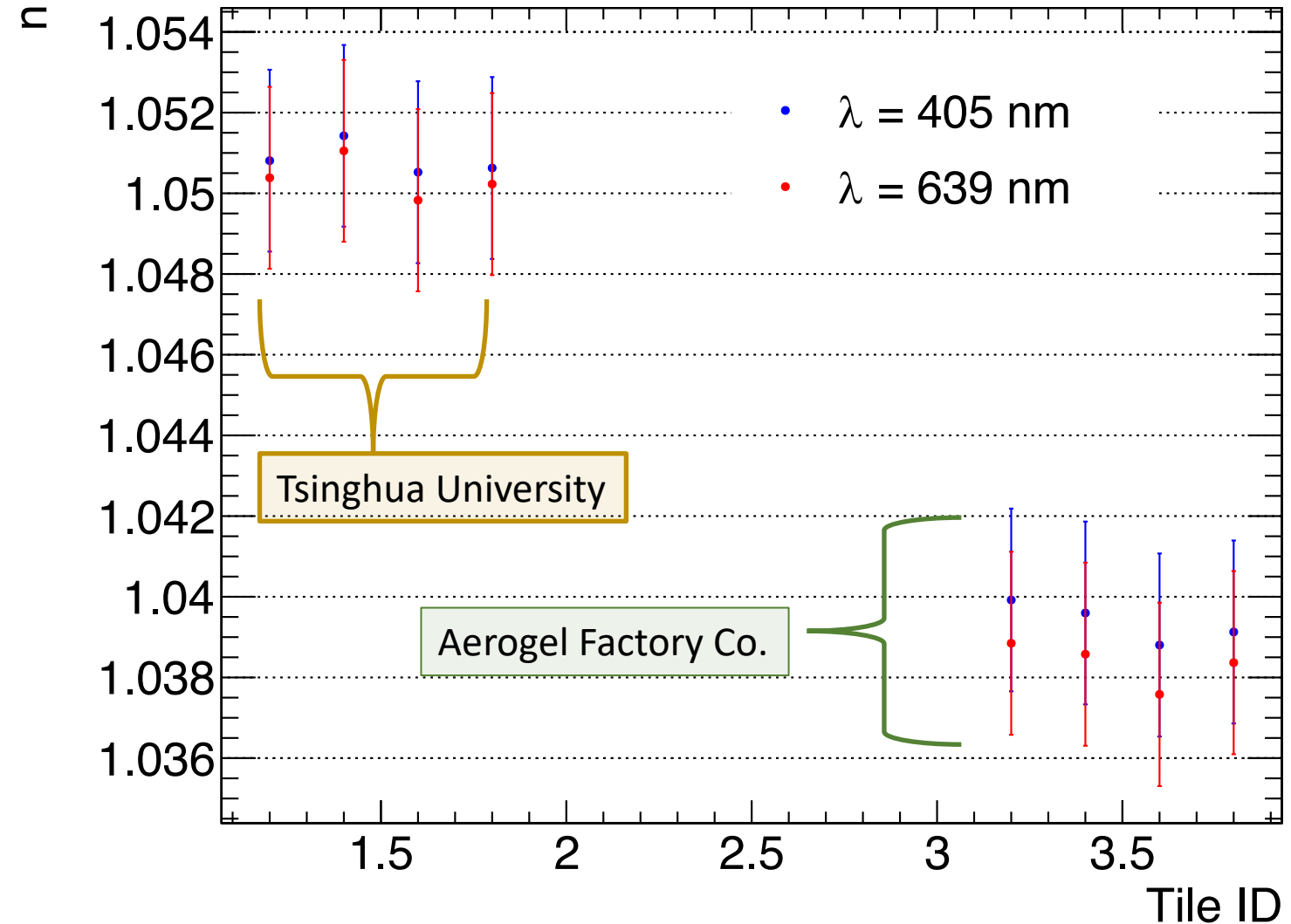
$$n = \frac{\sin\left(\frac{\Phi + \theta_{out}}{2}\right)}{\sin\left(\frac{\Phi}{2}\right)}, \Phi = 90^\circ$$



TU measurement setup

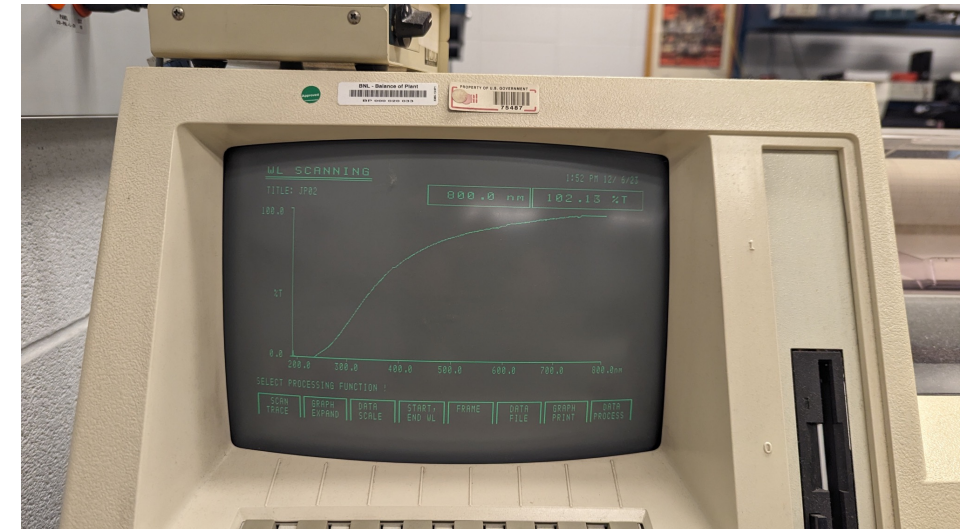
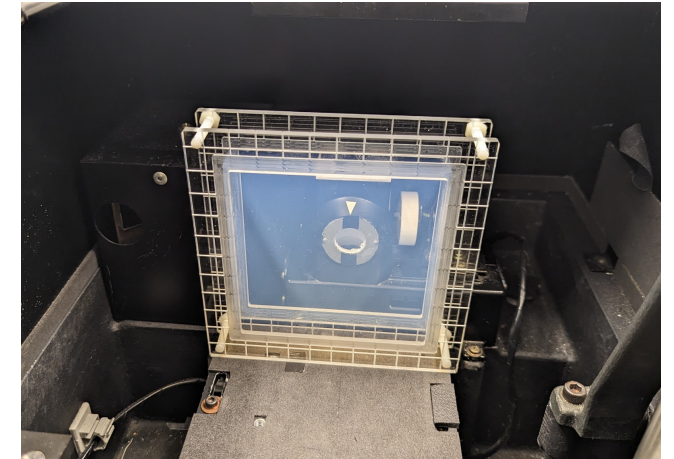


## Corner Index of Refraction

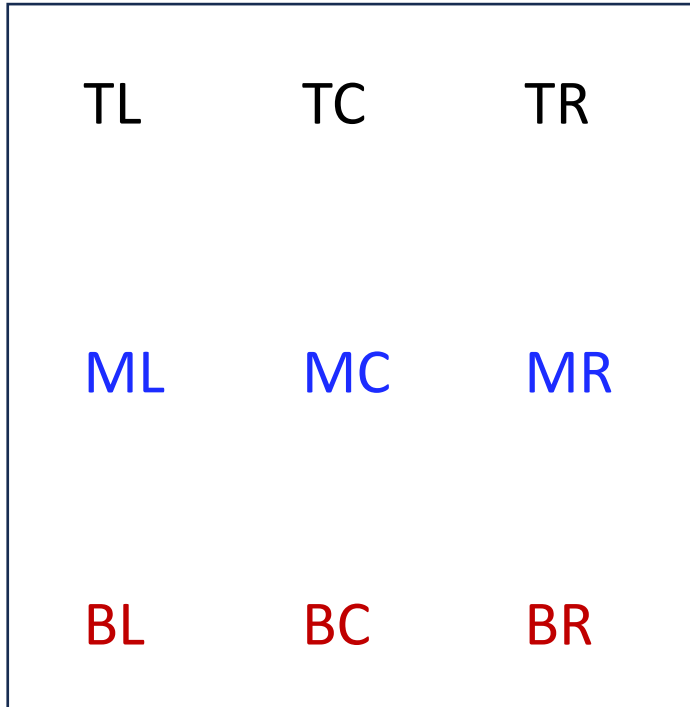




- ❑ Measure optical properties using Monochromator + Spectrometer at BNL
  - Results will be used to validate LED setup at Temple

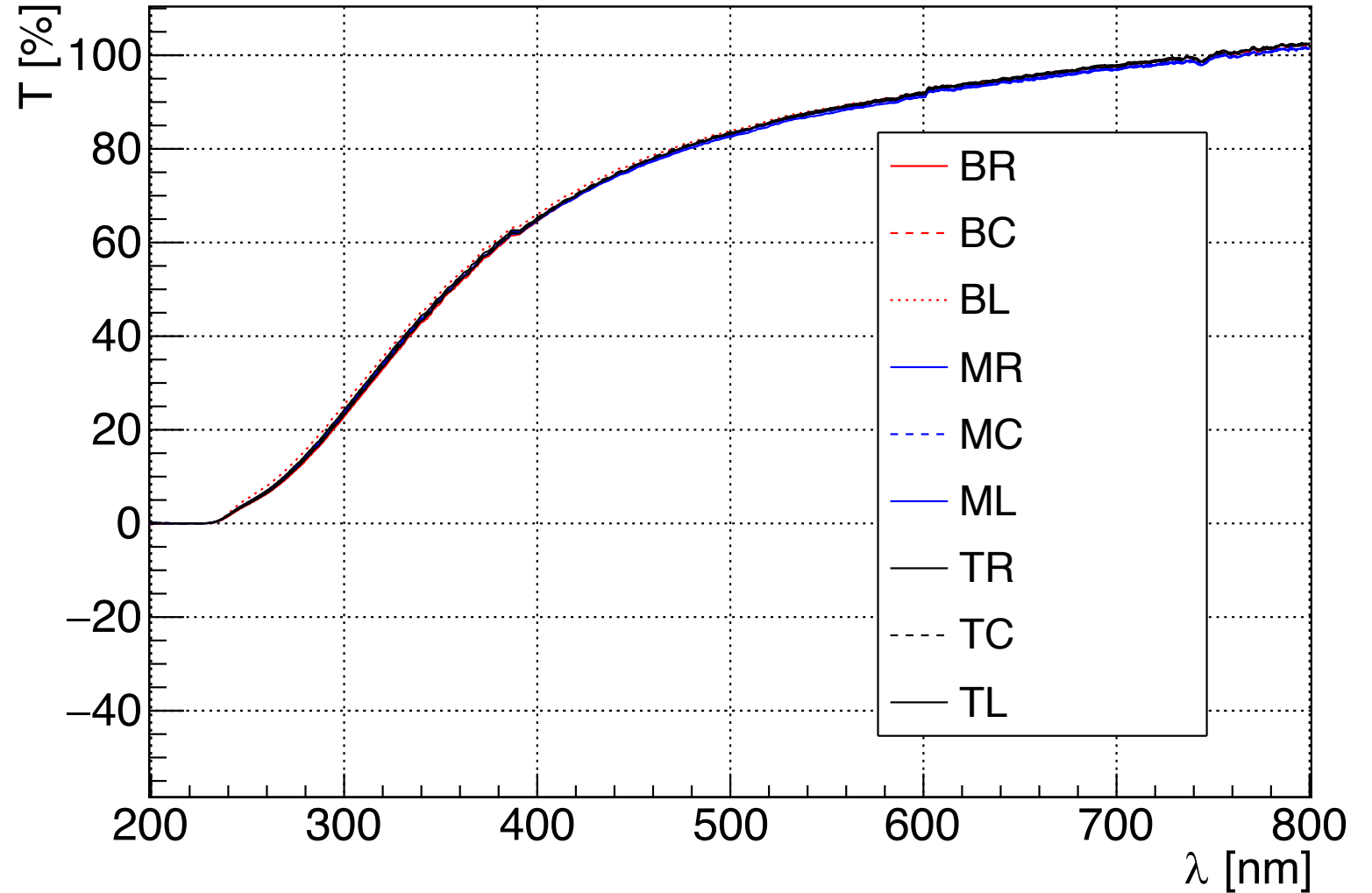


Area Scan



Aerogel tile (not to scale)

TSA88-1



## Area Scan

Transmittance (%) @ 400nm

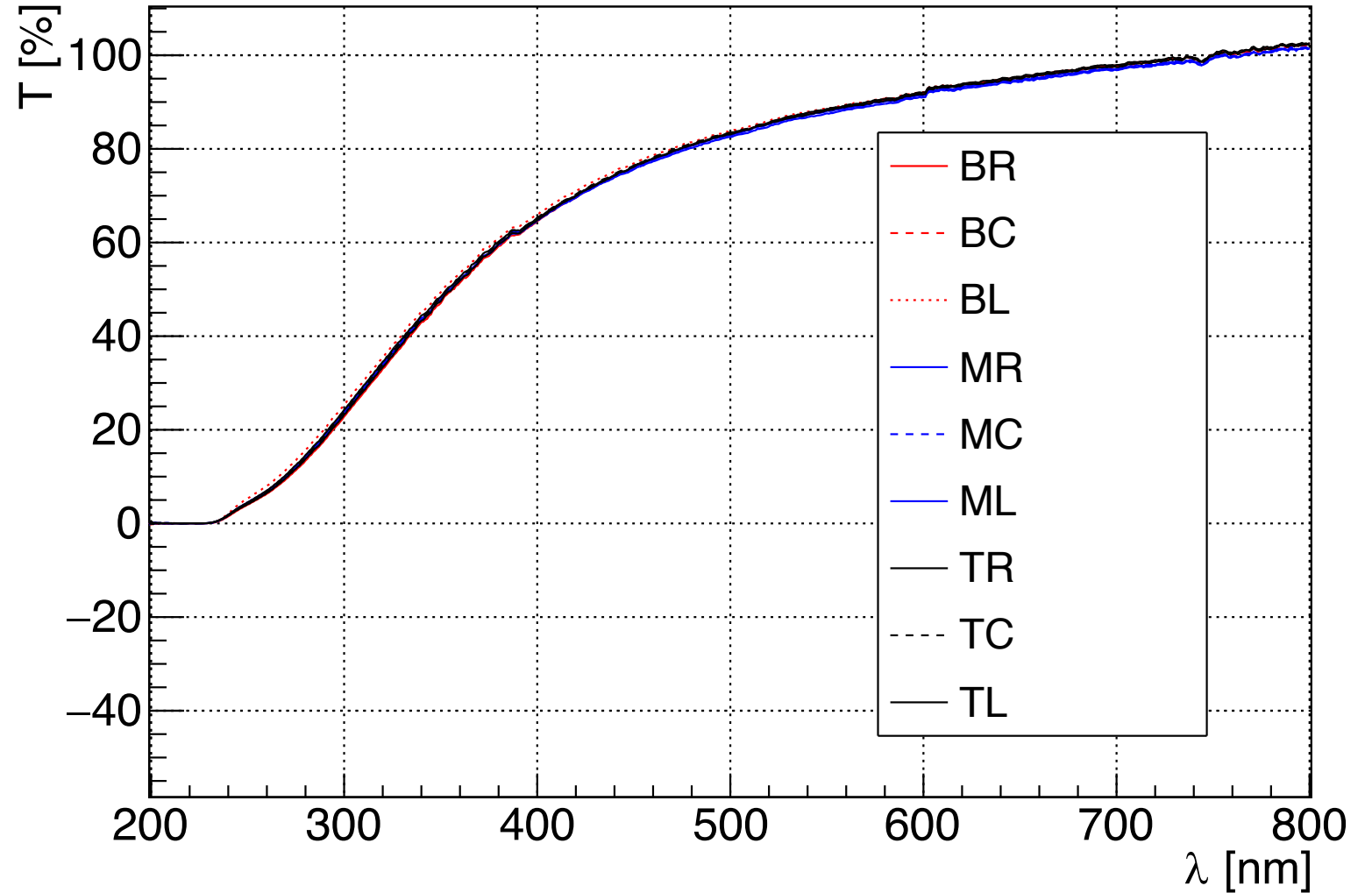
65.16 65.38 64.78

64.74 64.96 64.81

66.01 65.16 64.58

Aerogel tile (not to scale)

TSA88-1





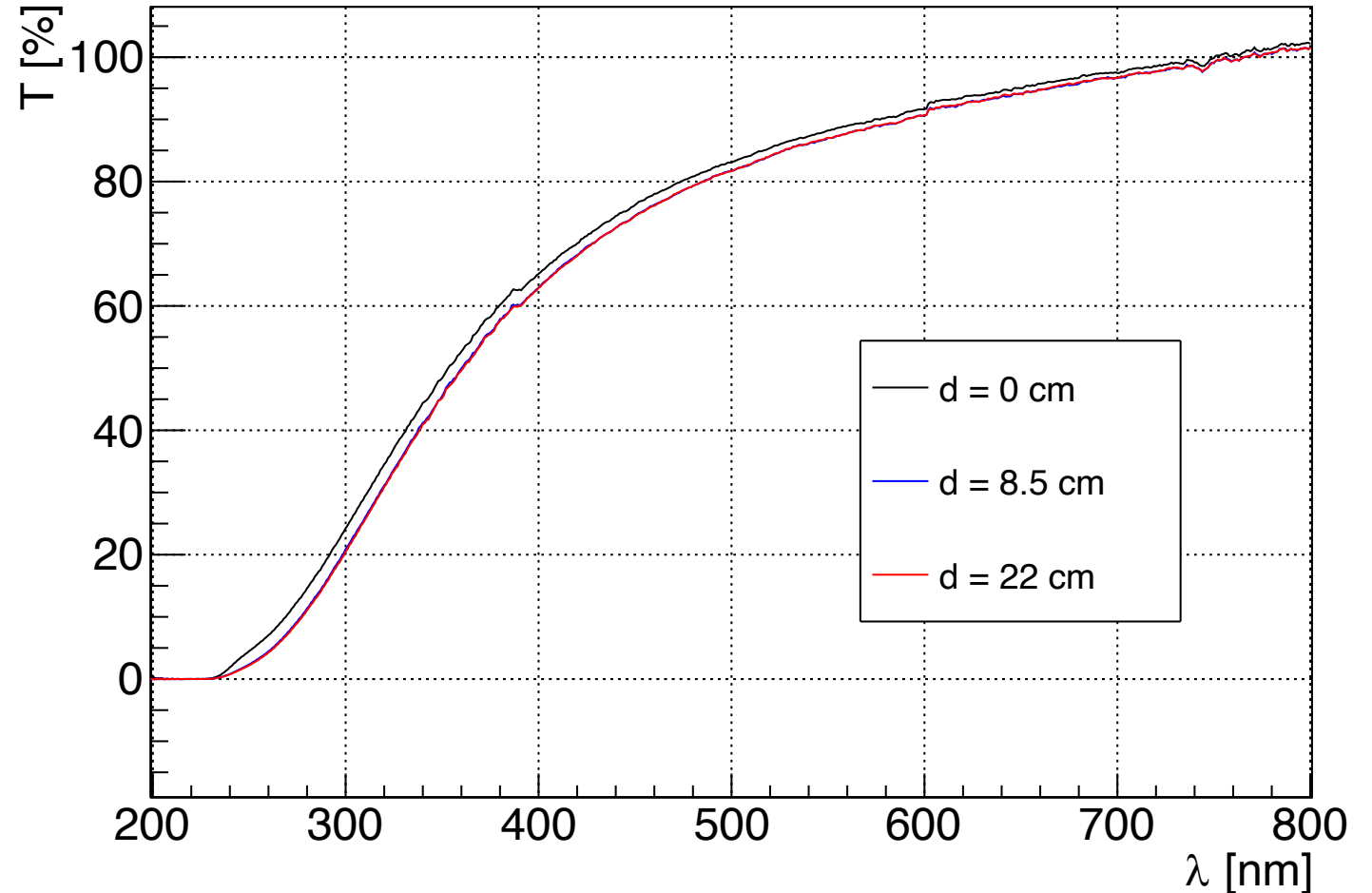
## □ Vary distance

- $d$  = distance between tile and integrating sphere

TSA88-1

Transmittance @ 400nm

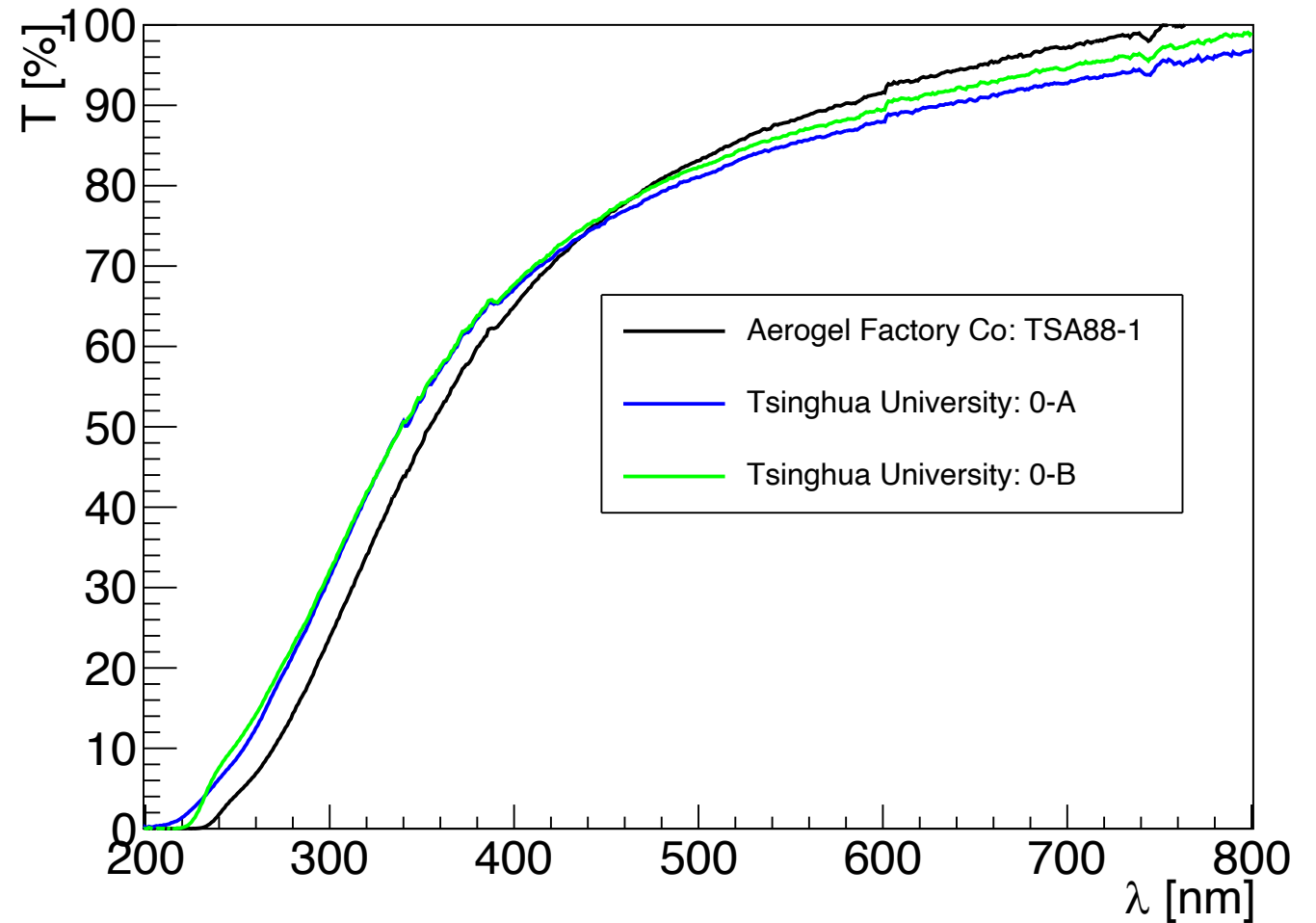
d [cm]	T [%]
0	65.16
8.5	62.93
22	62.91



## □ Tile Comparisons

- T of Tsinghua Univ. produced tiles better at low wavelength
- T of Aerogel Factory Co. produced tile better at higher wavelength
- Tiles have different measured index of refractions
  - TSA88-1:  $n \sim 1.039$
  - 0-A:  $n \sim 1.050$

Tile Comparison



## □ Optical measurements

- Setup capability to scan area of aerogel tiles
- Surround setup in dark box
- Use measurements from BNL to validate Temple setup

## □ Index of refraction measurement

- Install fixed CCD camera to measure diffracted beam
- Investigate measuring change in  $n$  vs. tile area