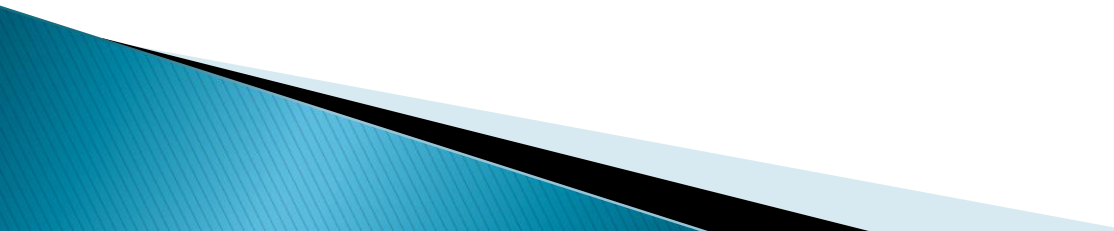


# Aerogel

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# SP-20

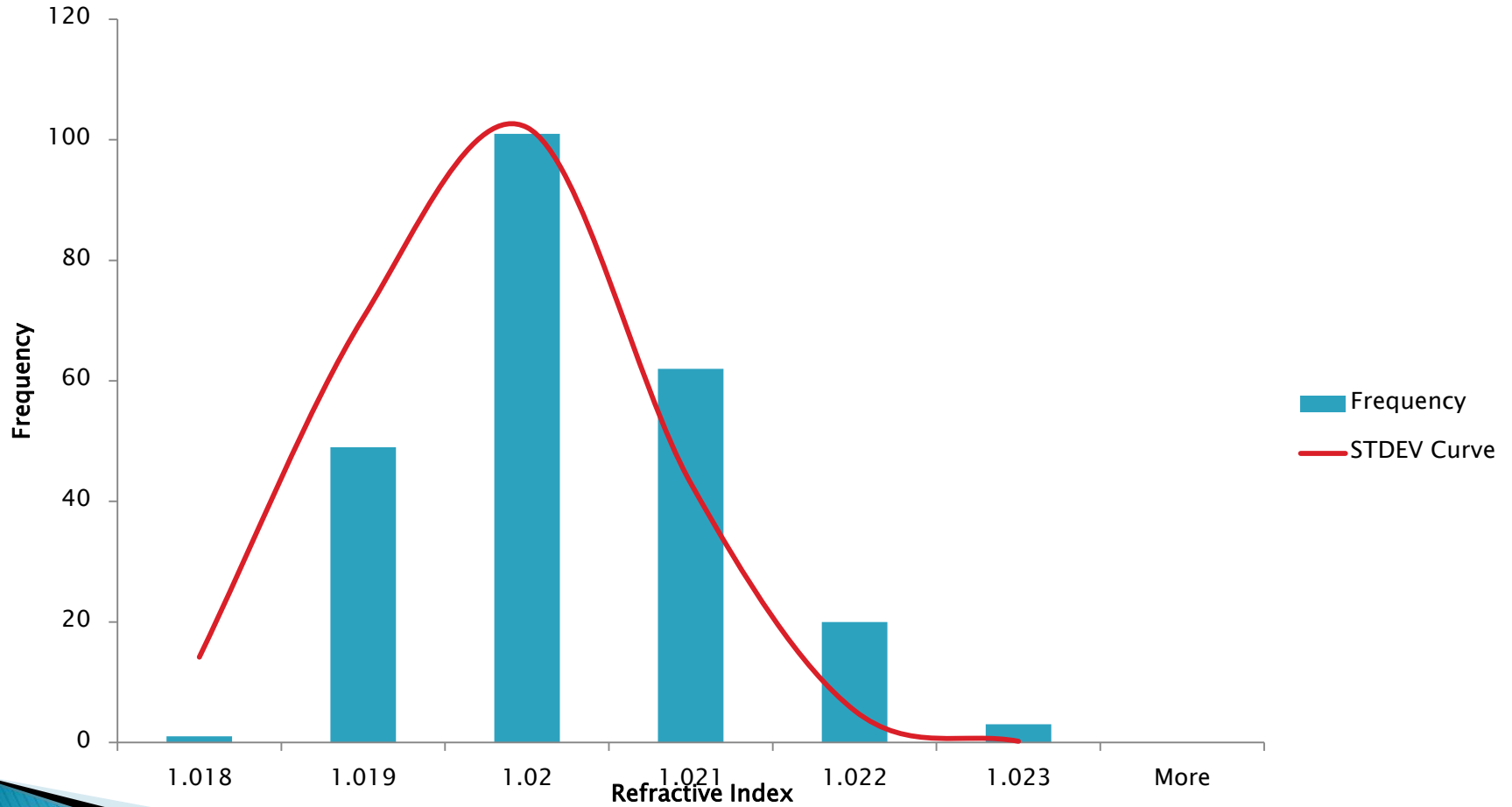
- ▶ All of the SP-20's have been measured with very few outliers
  - ▶ The graph can be seen on the upcoming slide
- 

# SP-20 Refractive Index

Mean 1.02

STDEV .0009

Tiles 236



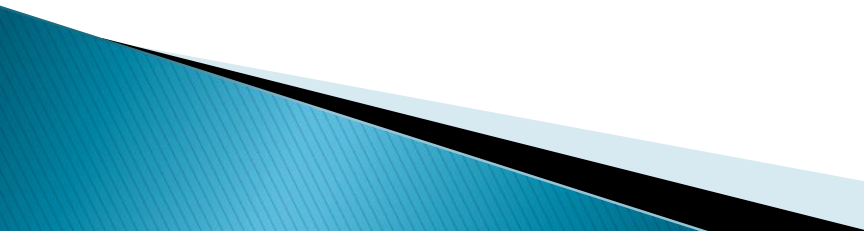
# Experimental Uncertainty

- ▶ Hasn't been added to the graphs yet, but has been calculated
- ▶ Calculating Uncertainty
  - Refraction(D): measured 1 tile 10 times
  - Distance between the tile and wall (L) :  $\pm 3.175$  mm, an uncertainty that had been previously defined
  - Incident angle(Alpha):  $\pm .5$  degrees, half of the smallest unit of measurement

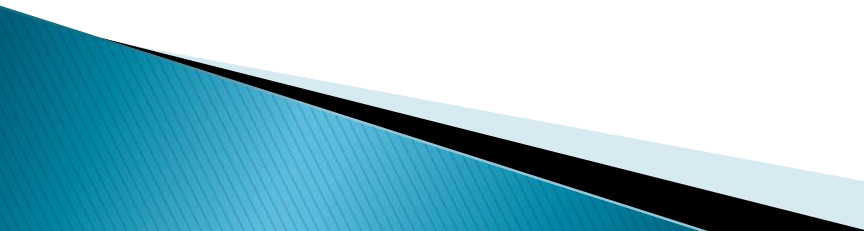
# Experimental Uncertainty

Measurement	D (mm)	L (mm)	Alpha (degrees)	Refractive Index		
1	47.41	1146.969	45.5	1.0208		
2	47.33	1146.969	45.5	1.0208		
3	47.51	1146.969	45.5	1.0209		
4	47.36	1146.969	45.5	1.021		
5	47.55	1146.969	45.5	1.0207	=	+/- .00015
6	47.56	1140.619	44.5	1.0207		
7	47.28	1140.619	44.5	1.0208		
8	47.68	1140.619	44.5	1.0208		
9	47.84	1140.619	44.5	1.0208		
10	47.51	1140.619	44.5	1.0208		
Standard Deviation	0.161	3.175	0.5	9.27025E-05		

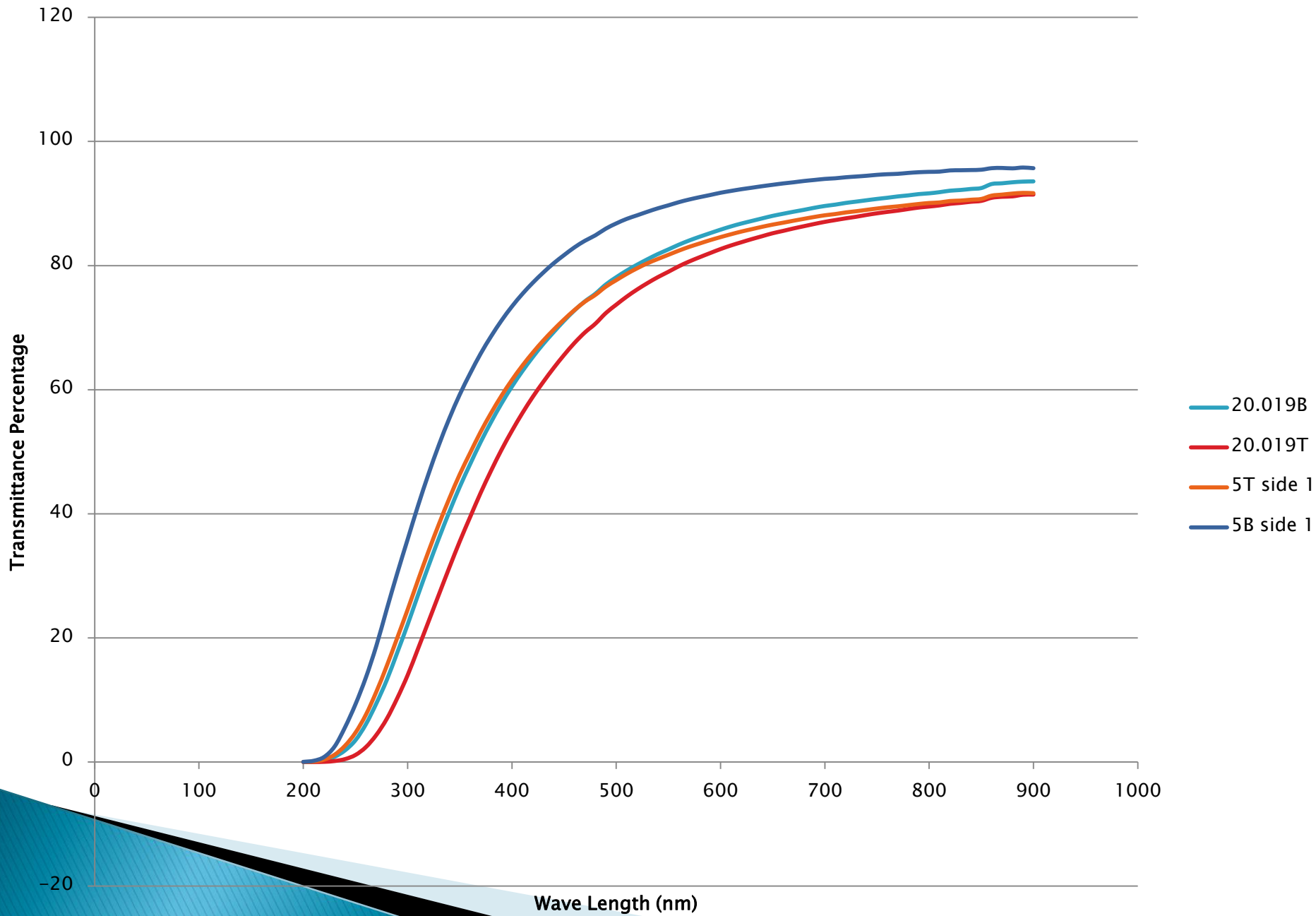
# Mathematical Uncertainty

- ▶ As Marco suggested last week we found how much each variable affects the refractive index
  - ▶ We added and subtracted two percent to each variable and compared the results to the original
  - ▶ We found that  $D$  affected the refractive index the most, followed by  $L$  and the angle of the tile's corner
- 

# Transmittance

- ▶ We ran transmittance tests on SP-20 and SP-30 tiles
  - ▶ Although the SP-30's are denser, the SP-20 are generally much more cloudy and therefore have a lower transmittance
  - ▶ In the graph it can be seen that when a SP-30 is both cloudy and more dense, though, it drops below some of the SP-20's
- 

# Transmittance Comparison





# Humidity

- ▶ Humidity tests continue
  - ▶ Found that by adding water to the bottom of the container the humidity would increase to the 90% range
  - ▶ In the two tests we've run the refractive index still shows no significant change
  - ▶ A corner broke when putting the last tile in, so we left it in the water and it too showed no significant change.
- 