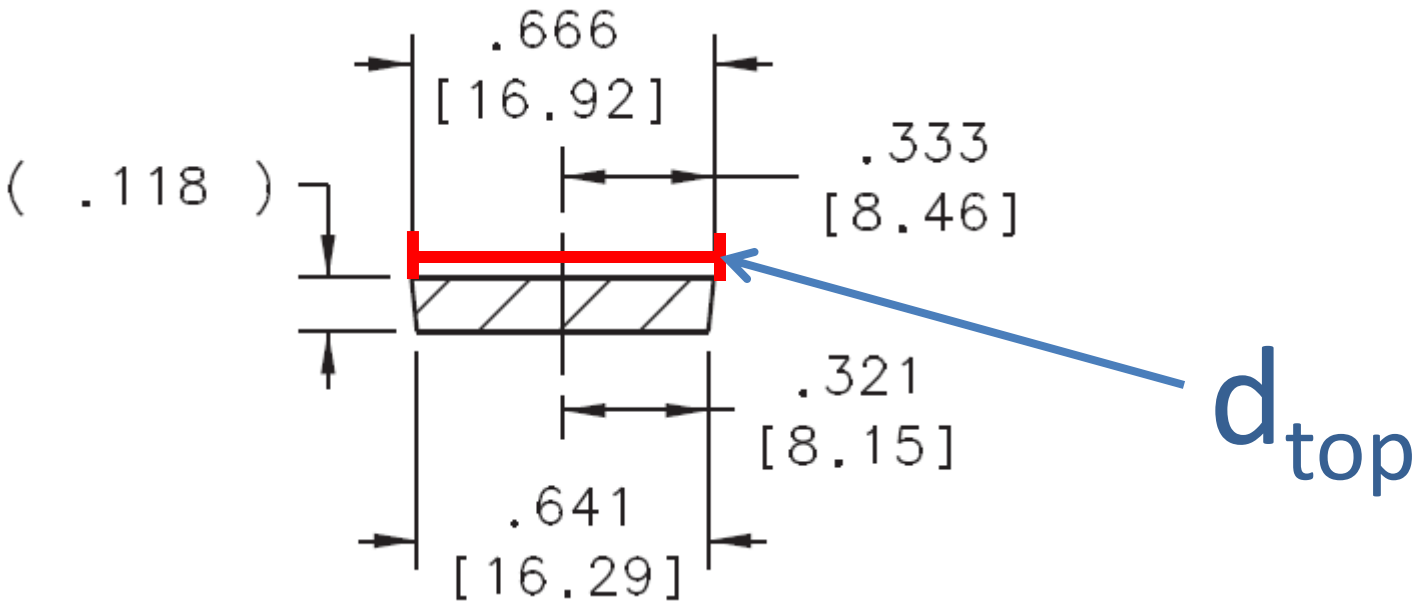
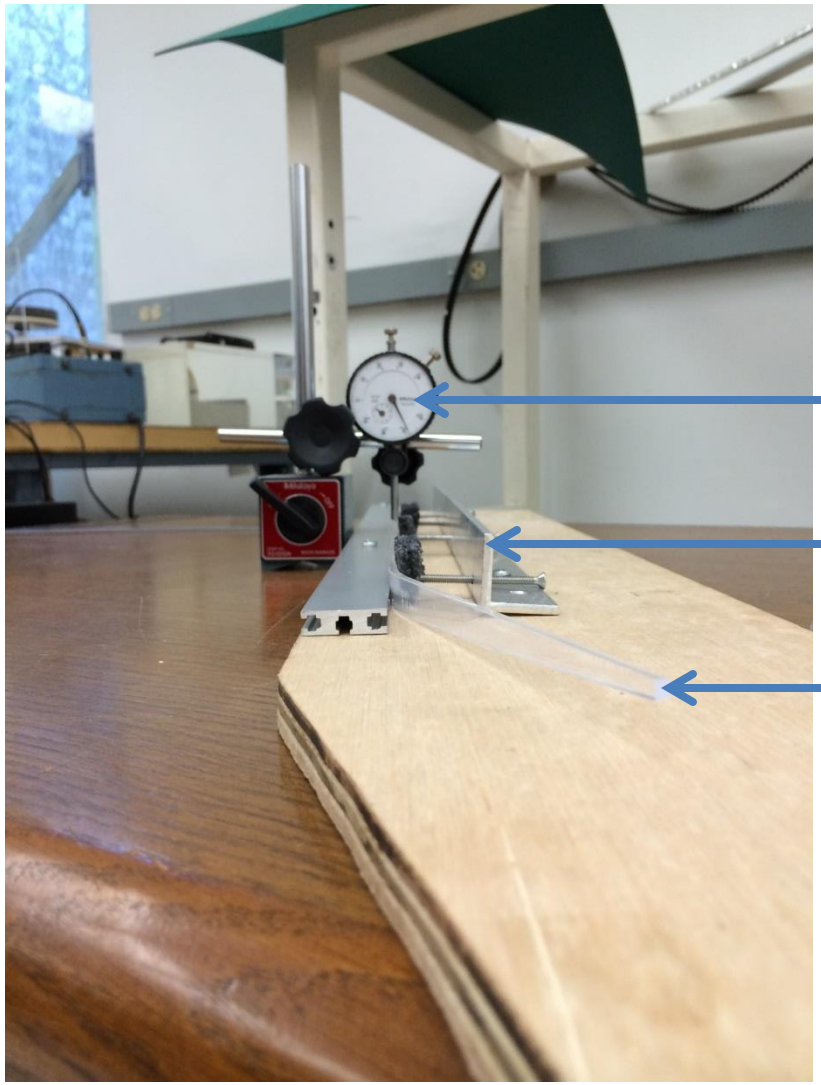
Paddle Measurements w/ Foil



- We aimed to continuously measure any variations of design specifications along the straight section of a machined scintillator (paddle 3 was used)
  - Also aimed to measure the quantity d_{top} at various locations along the straight section
- Aluminum foil is 16.5 µm thick
- Paddle wrapped in AL should have d_{top} = 16.953 µm (0.6674”)

Continuous Measurements

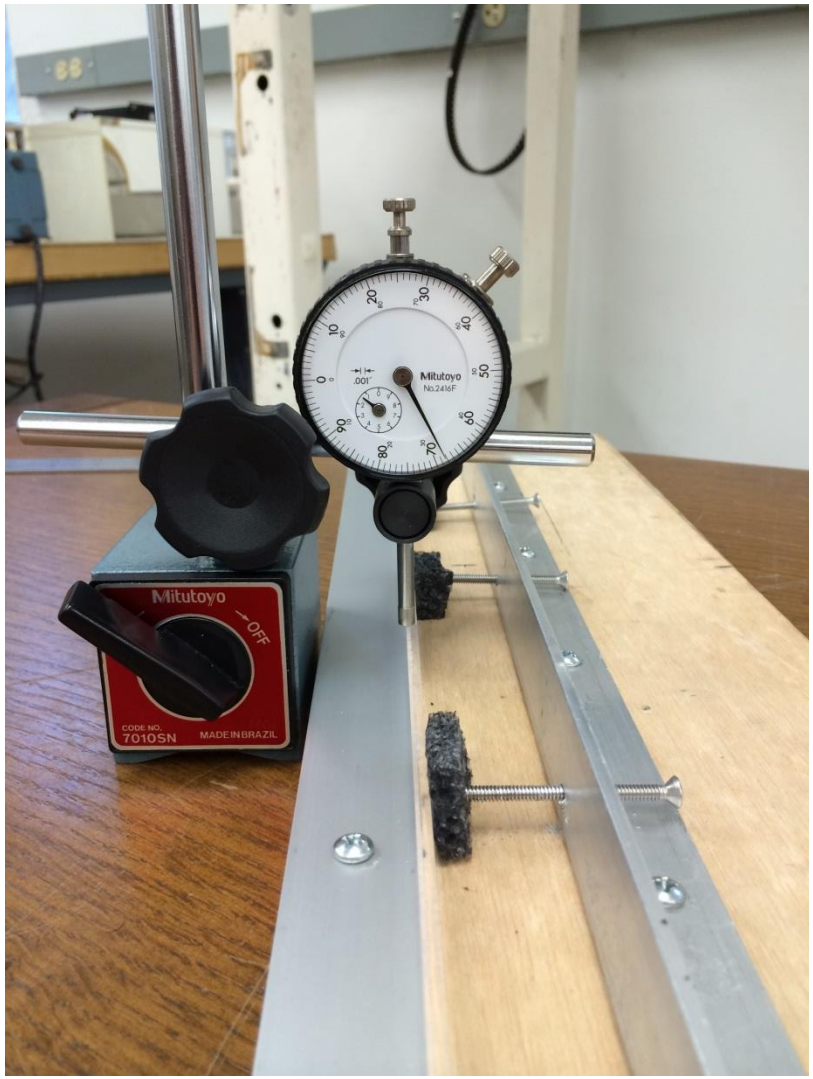


Micrometer (hemispherical probe tip)

Guide Rail & Clamp

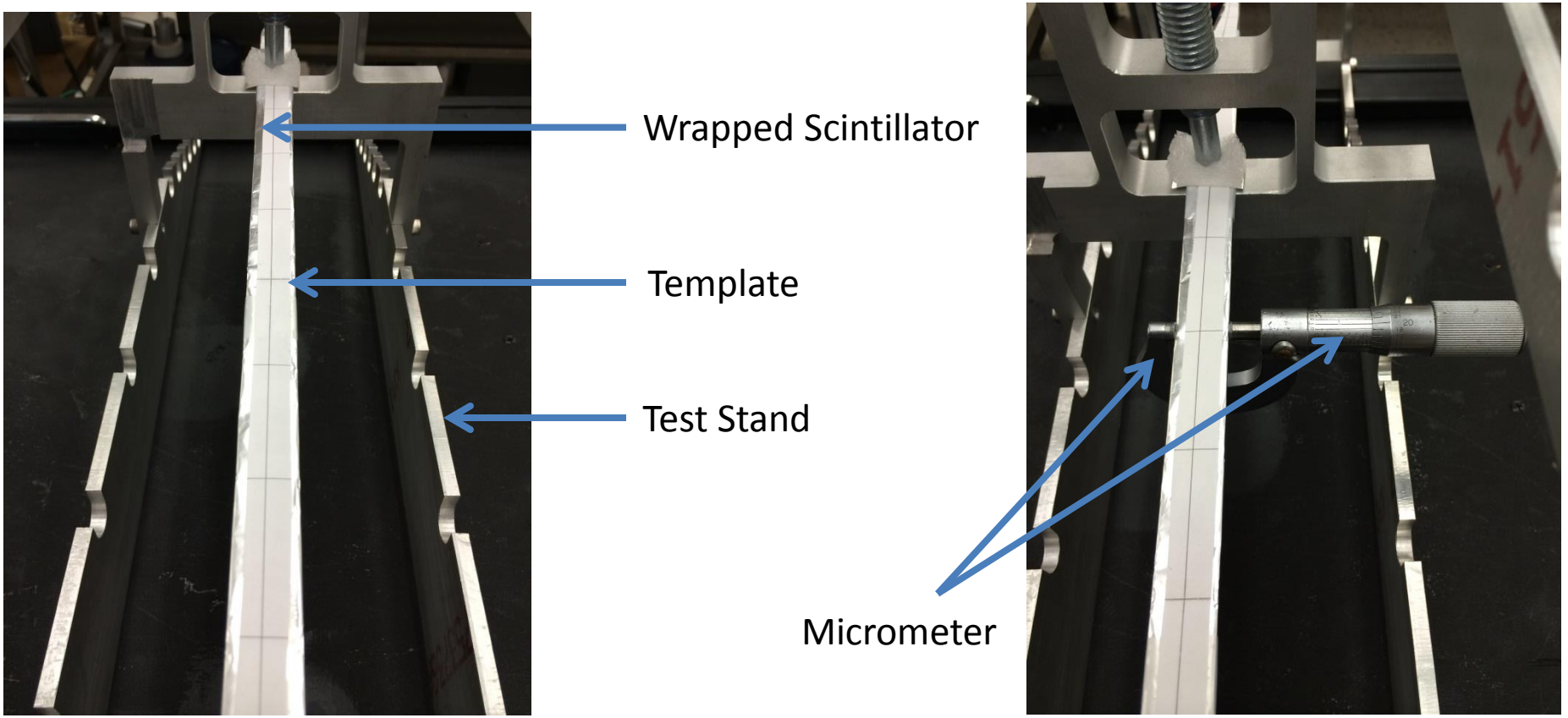
Unwrapped Scintillator

Continuous Measurements (cont.)



- Results were unreliable!
- If the micrometer probe traverses down the edge of the scintillator the deviations are huge (0.0400”)
- Any misalignment between the guide rail and the micrometer also results in large deviations
- If consistent and reliable measurements were desired using this method, custom tools would need to be developed
- Another solution exists!

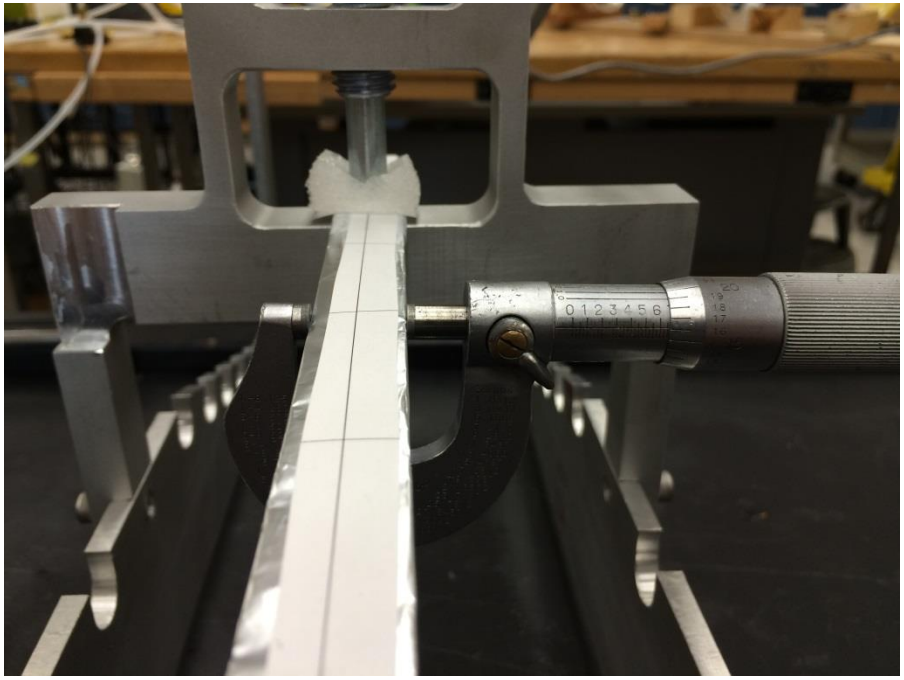
Discrete Measurements



- Scintillator was wrapped in Aluminum foil
- Template was used to increase the reproducibility of the measurements
- 8 measurements were made along the straight section (39.465 mm apart)
- Utilized a 0.0001” resolution micrometer with flat probes
- Measured d_{top} at each of the 8 locations (measurements made 3 times)

Discrete Measurements (cont.)

Nominal Specs:
Unwrapped: d_{top} = 16.92 mm (0.6661”)
Wrapped: d_{top} = 16.953 mm (0.6674”)



- On average:
  - d_{top} = 19.9151 mm ≈ 19.2 mm
  - ≈ 38 µm under spec
- In all instances the wrapped scintillator measured under spec
- At worst the paddle was ≈ 62 µm under spec
- At best the paddle was ≈ 13.7 µm under spec

- The maximal difference between any two measurements was ≈ 48.3 µm
- If needed: The other paddles can be measured in this manner