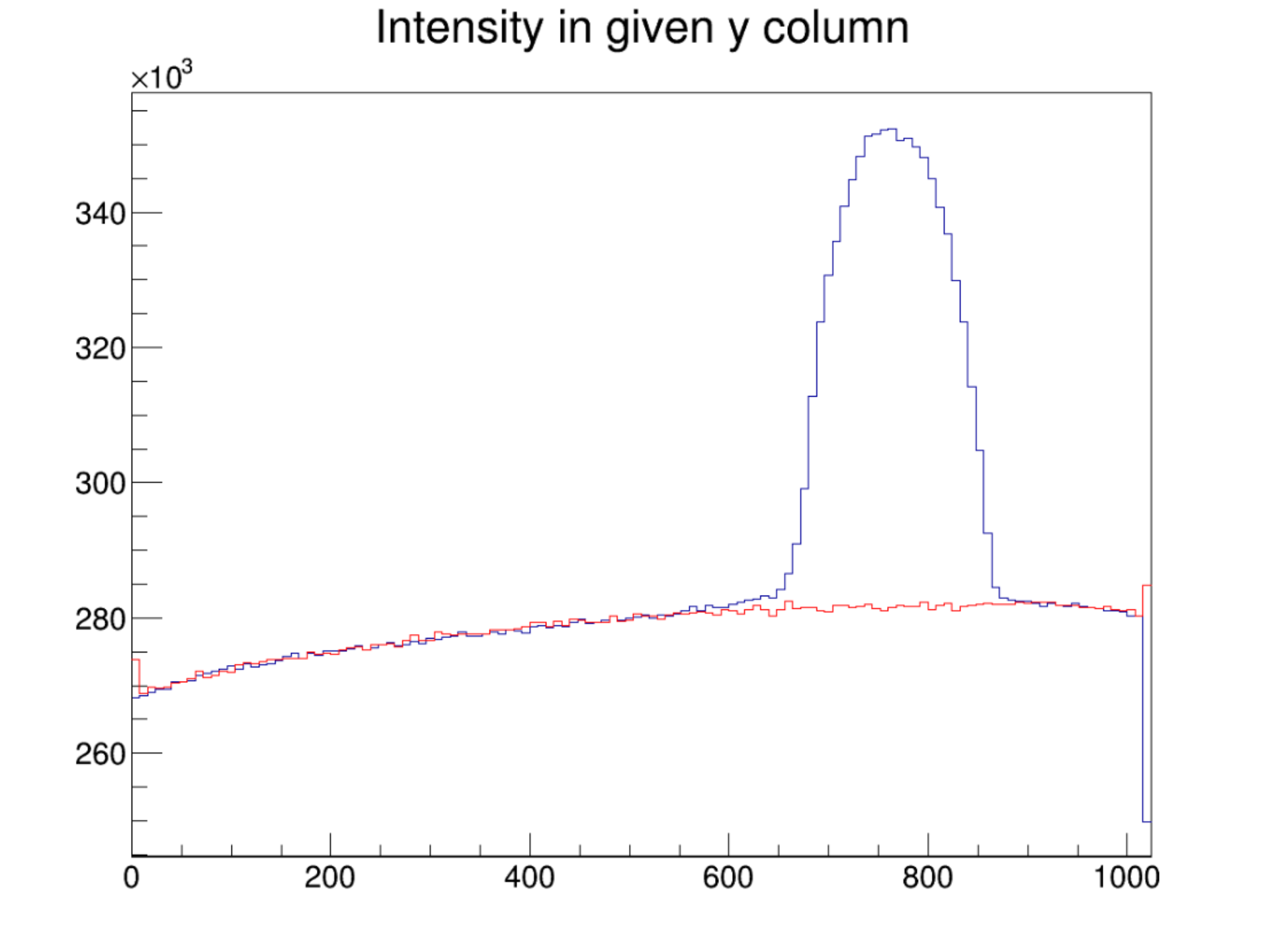
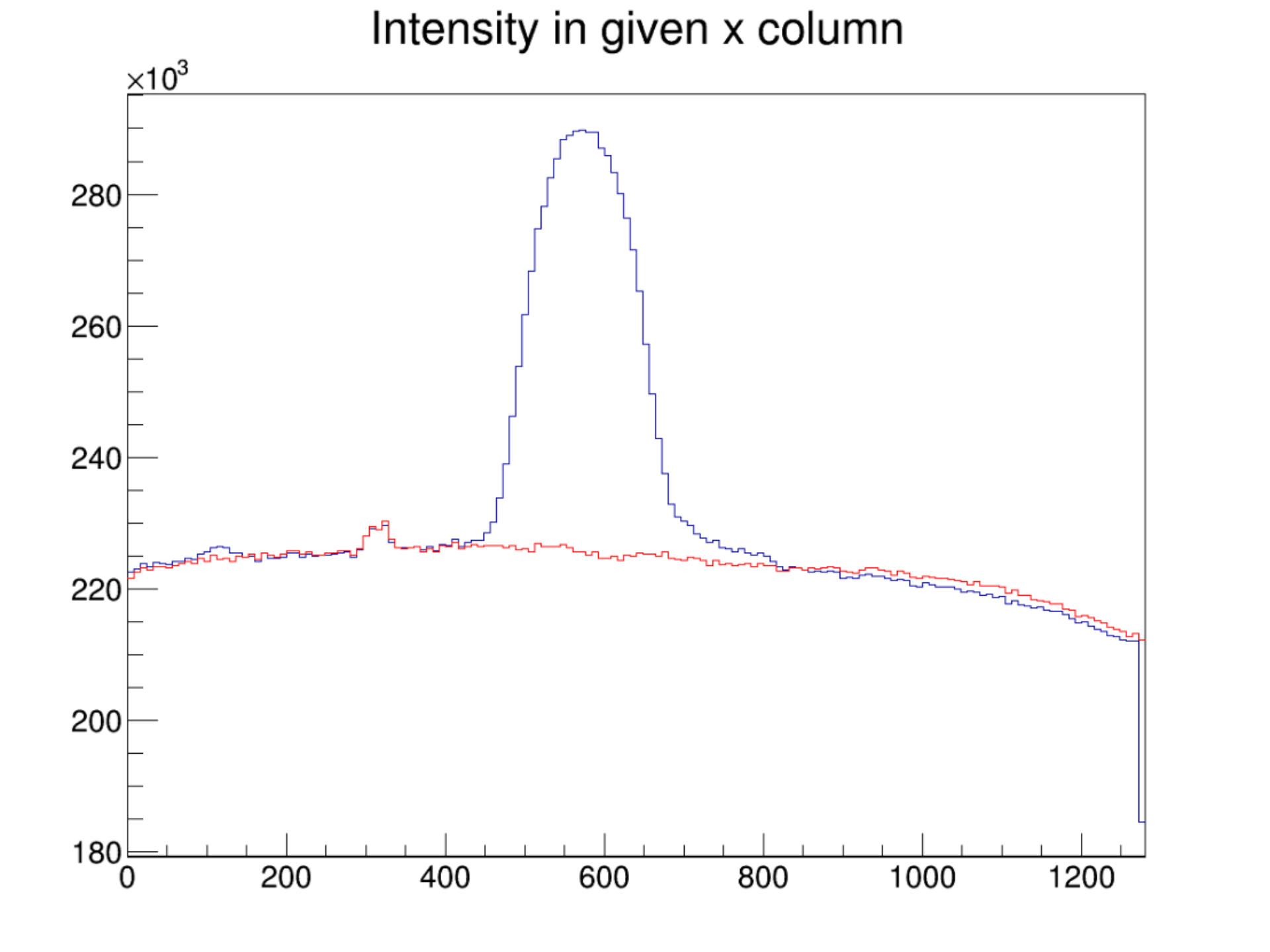
Mirror Updates

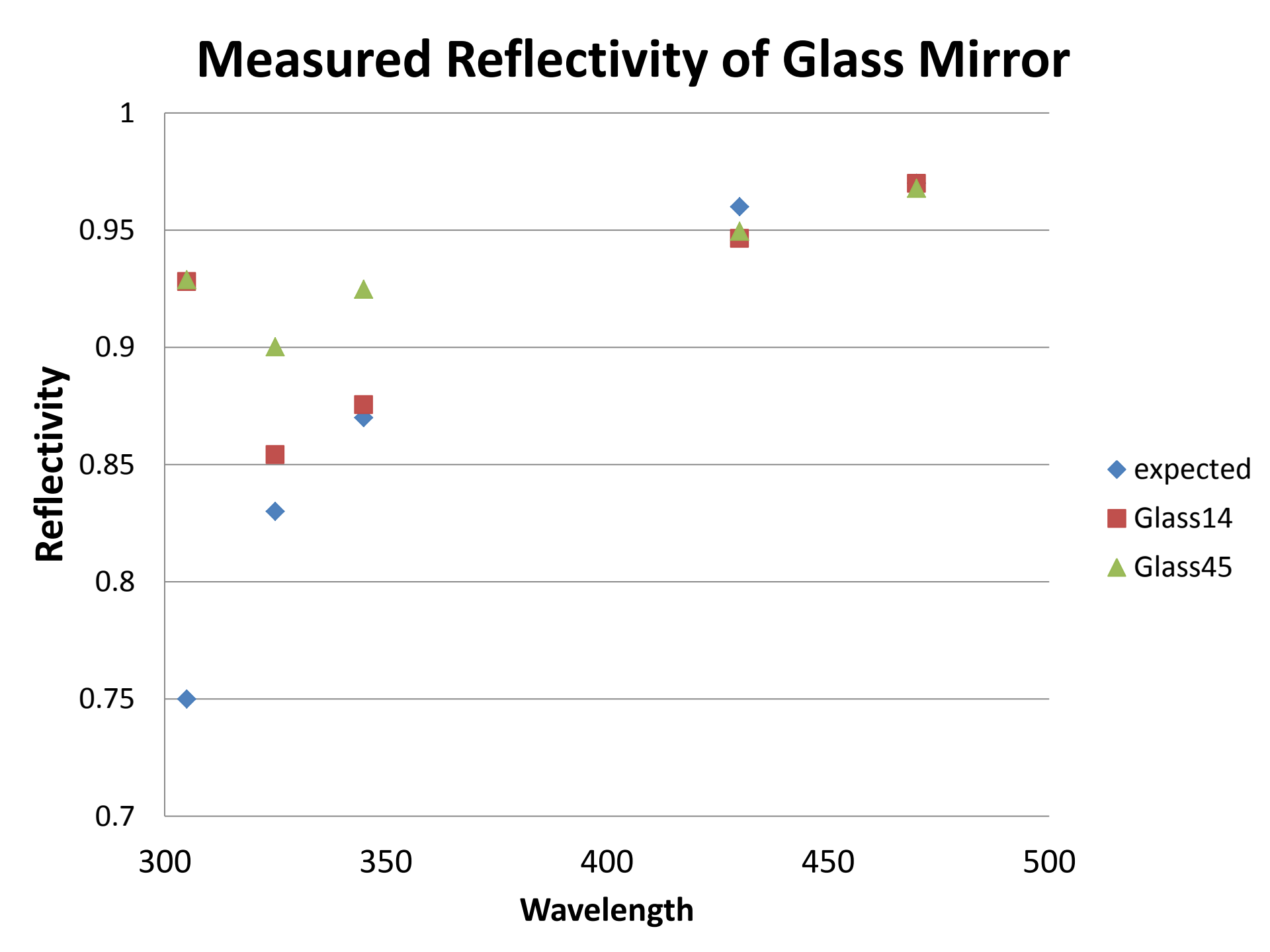
07/30/15

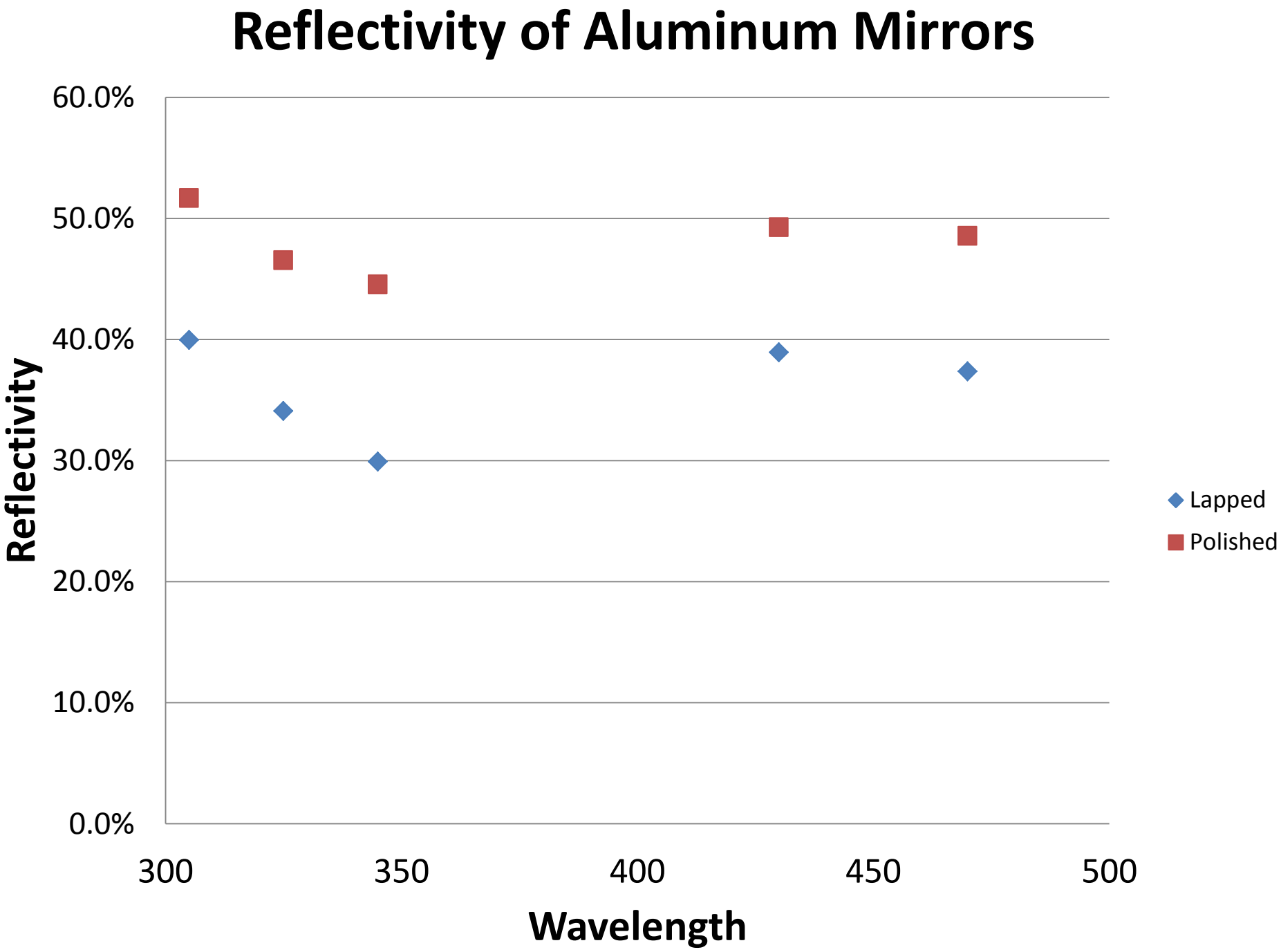
Reflectivity Measurements

- Find maximum value in x or y projection plane
- Scale background so integrals of signal and background histograms more than 120 pixels away from max agree
  - Approximate size of spot
- Subtract background from signal inside this window


Intensity in given y column
×10^3
340
320
300
280
260
0
200
400
600
800
1000


Intensity in given x column
×10^3
280
260
240
220
200
180
0
200
400
600
800
1000
1200


Measured Reflectivity of Glass Mirror
1
0.95
0.9
0.85
0.8
0.75
0.7
Reflectivity
300
350
400
450
500
Wavelength
expected
Glass14
Glass45


Reflectivity of Aluminum Mirrors
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Reflectivity
300
350
400
450
500
Wavelength
Lapped
Polished

Notes

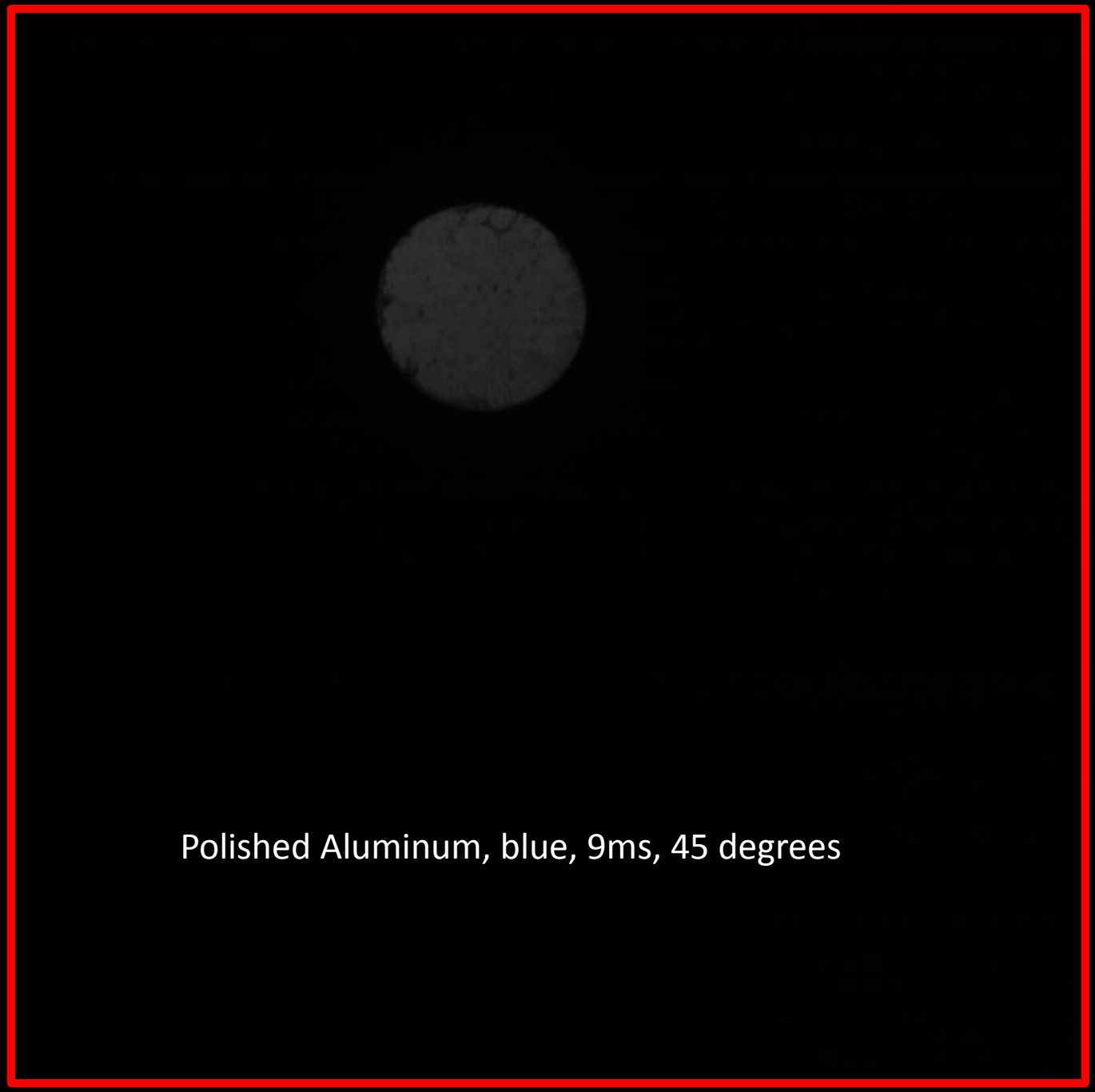
- The “430nm” is really a purple LED, and may in fact be red dominated
- The 305nm seems to have strange behavior on both the Aluminum and the glass – perhaps it has a component not at 305nm which is dominating
- The other measurements match pretty well the expected reflectivity of the glass at 14 degrees
- The 45 degree reflection is stronger at lower wavelengths

Aluminum Mirrors

- Lapped mirror appears cloudy, and a dispersion is visible to the eye
  - Seems to be too wide to be captured in the camera and translated to a reduced reflectivity
- Neither finish has an acceptable level of reflectivity (even in the visible).

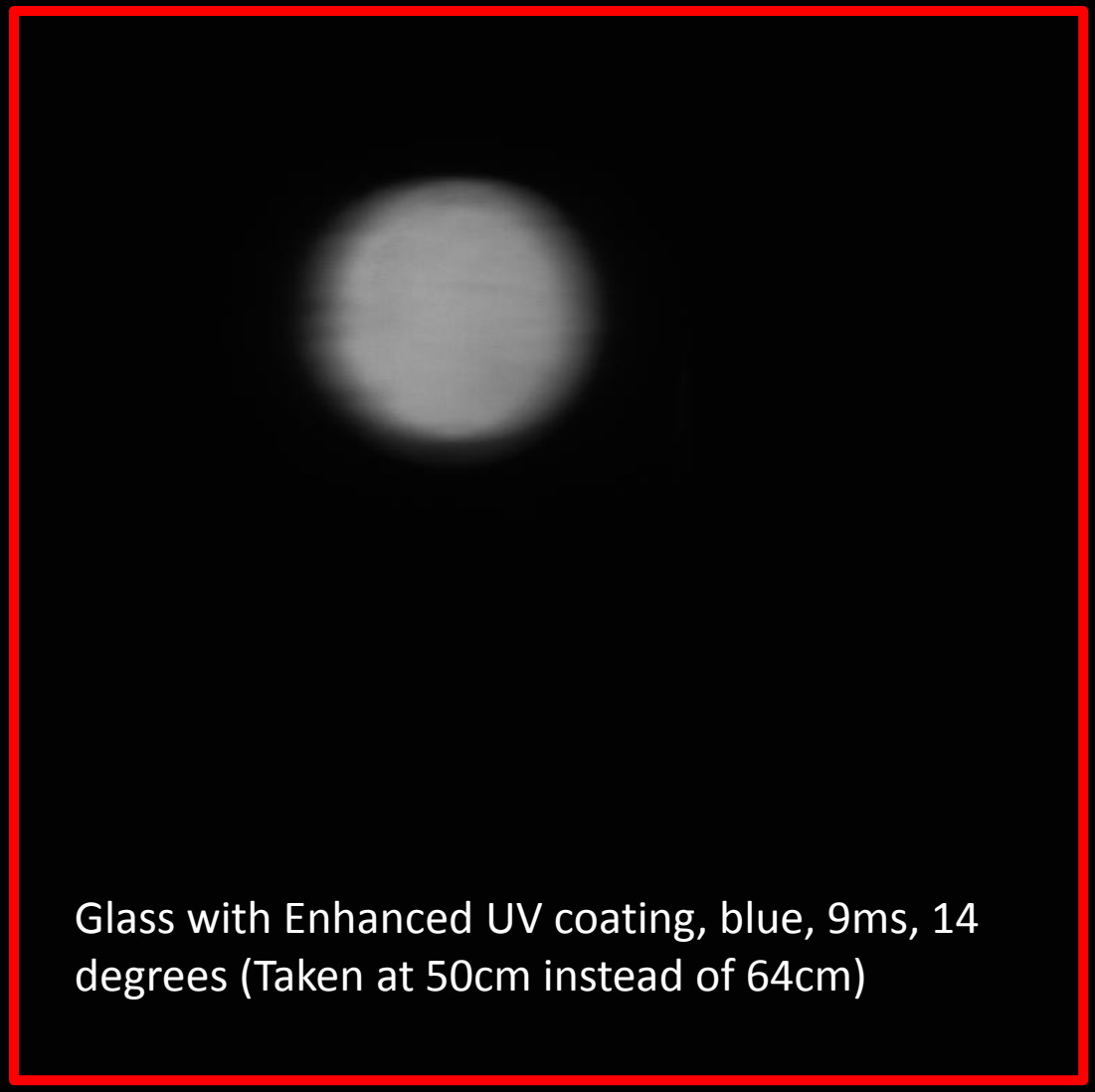
Dispersion of the mirrors

- The next slides show the images of the source (a 1mm circle) along with a square approximating the equivalent a 6x6mm pixel taken 64cm from that point
  - Approximately the distance of most of our photons
- The dispersion is too small to reasonably measure, but shouldn't affect us



Polished Aluminum, blue, 9ms, 45 degrees

Glass with Enhanced UV coating, blue, 9ms, 45 degrees



Glass with Enhanced UV coating, blue, 9ms, 14 degrees (Taken at 50cm instead of 64cm)

Glue submersion test

- Glued mirror to Aluminum
- Measured thickness around border of glas, Al base, and whole assembly
- Going under water