

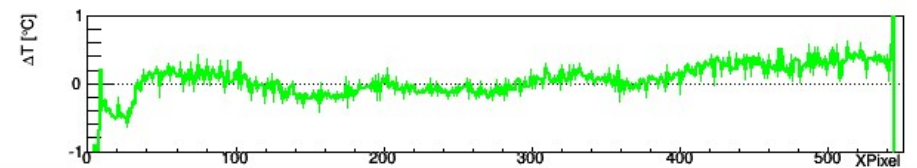
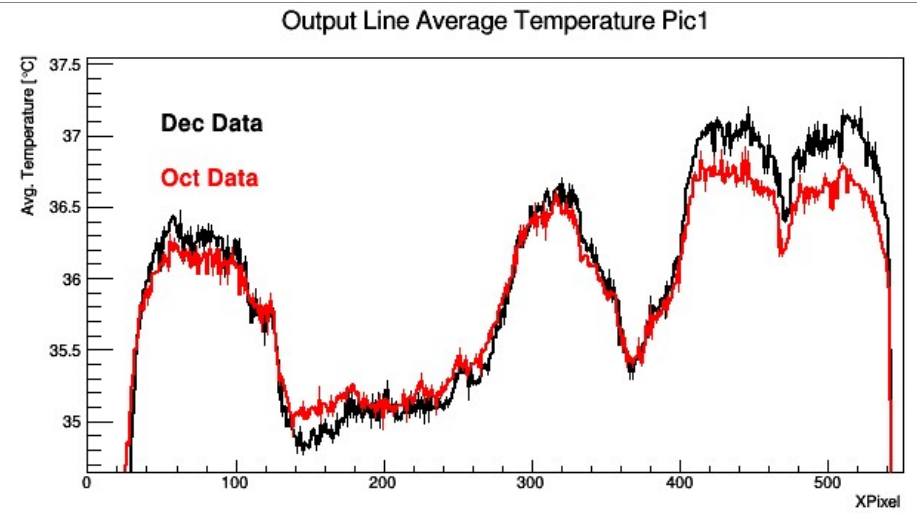
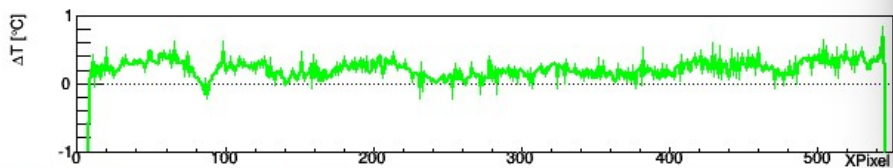
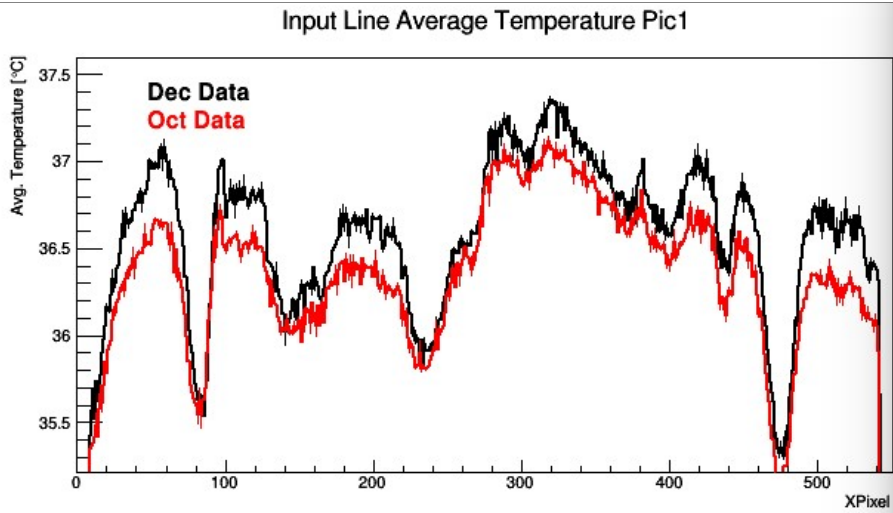
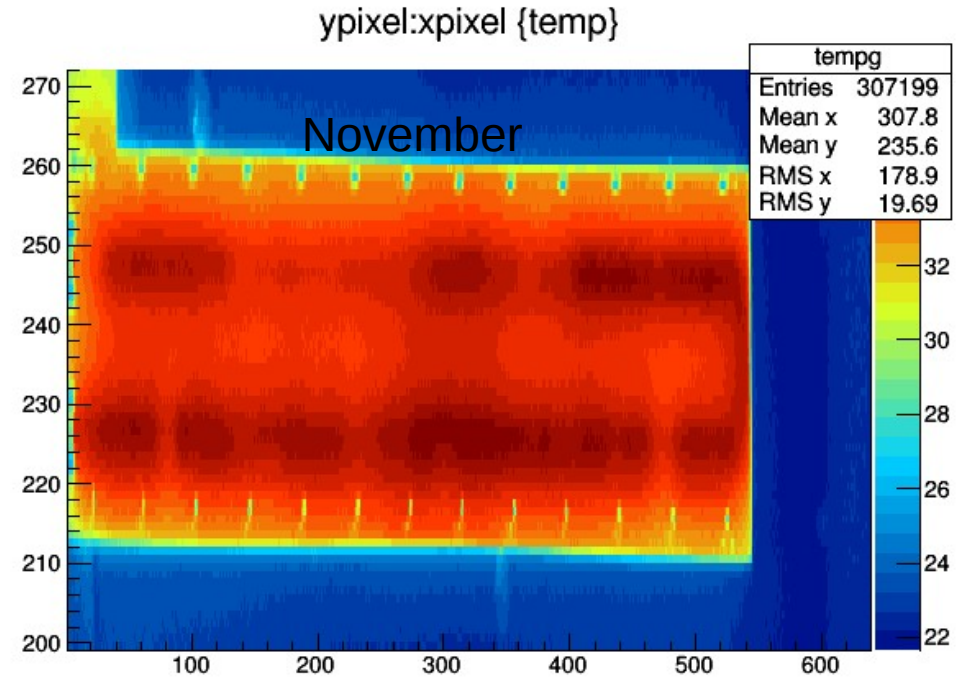
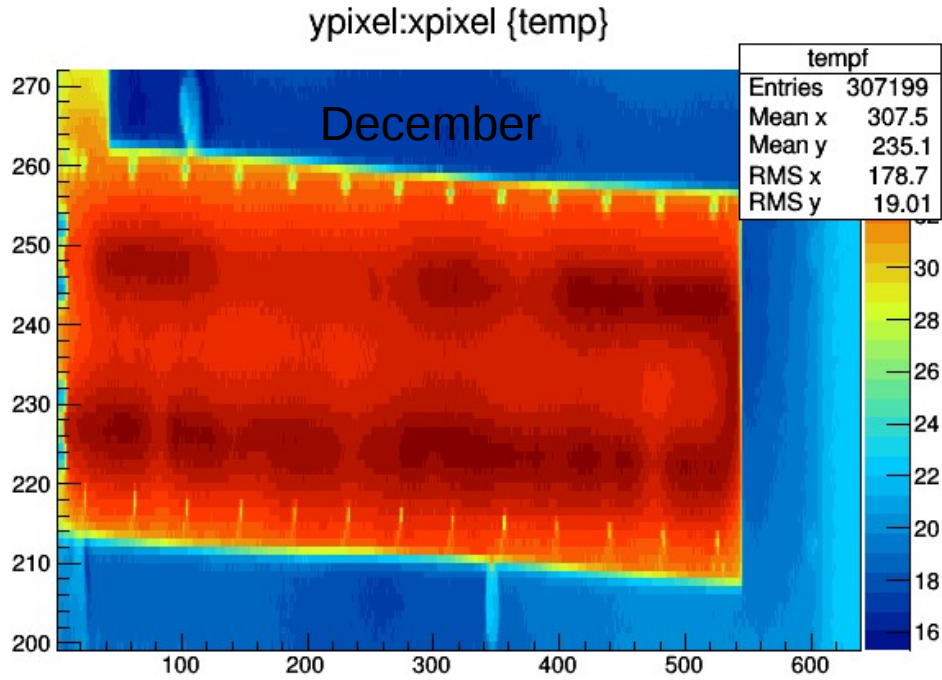
Thermal Imaging Stave Update

William Heidorn
Jan-18-2017

Reproducibility Experiment

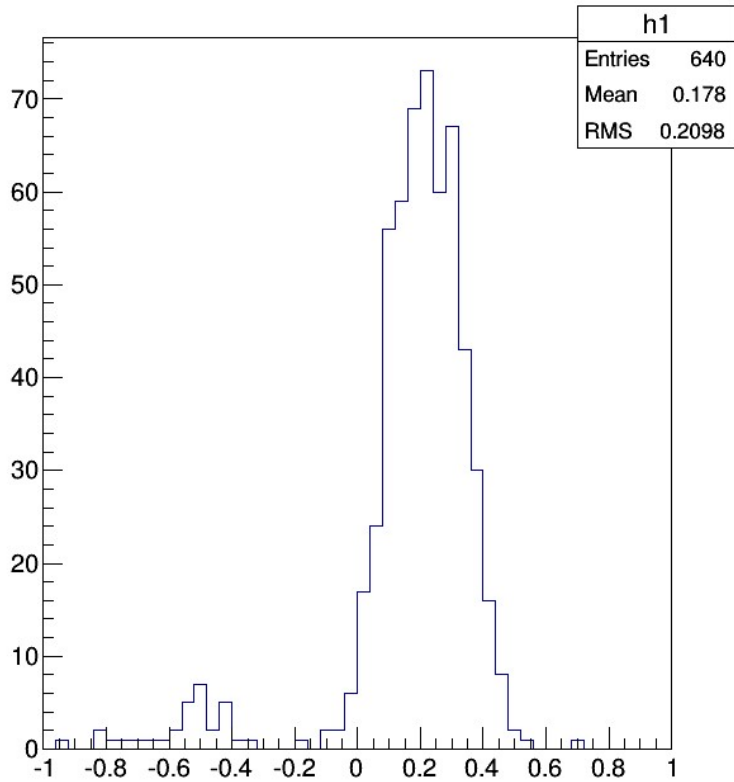
- Data taken from Nov compared with Dec data
- Both sets of data were taken at maximum(+40 °C) and minimum temperature(-50°C)
- Chiller Pump was set at 22rpm
- 200 Frames were taken at 6.25 frames/sec and averaged to a single frame
- The root program used takes max/min temperatures along pipe(x-dir.) and averages 2 points above and below the maximum in the y direction to create a line profile of the cooling pipe. The newer data is then subtracted from the older data to create difference plots.

High Temperature Measurements L-Side

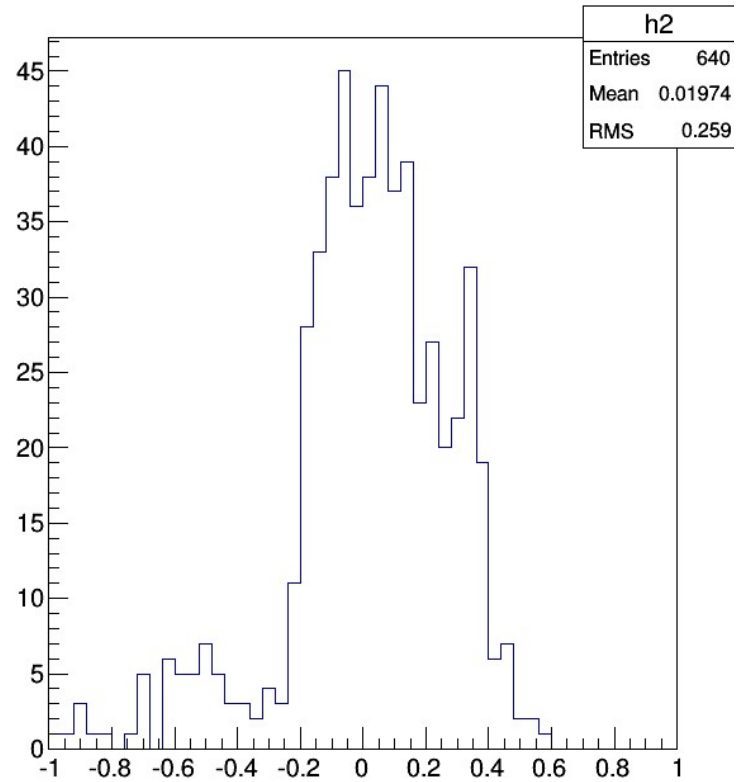


L-Side Difference Histograms

Temperature Difference Input Line

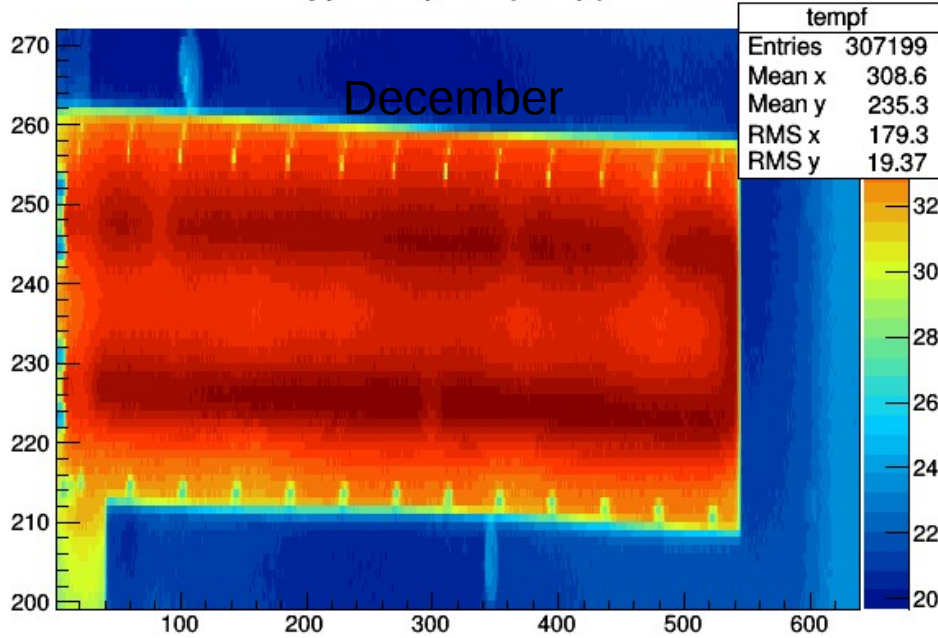


Temperature Difference Output Line

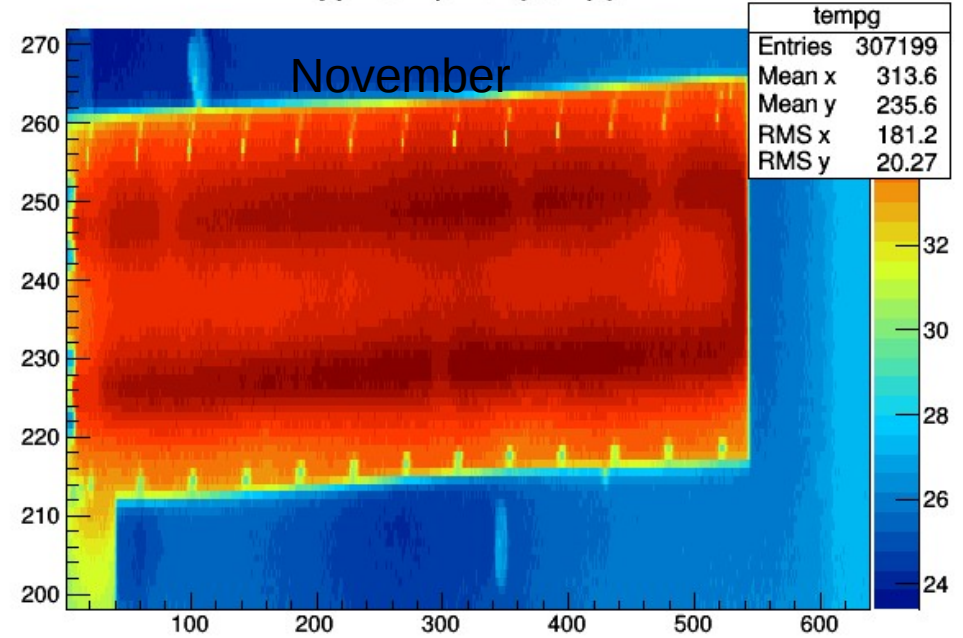


High Temperature Measurements J-Side

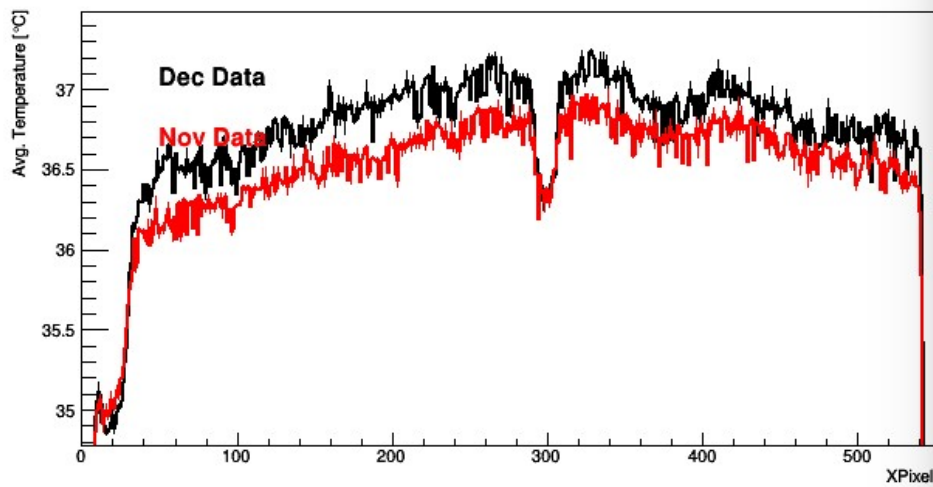
ypixel:xpixel {temp}



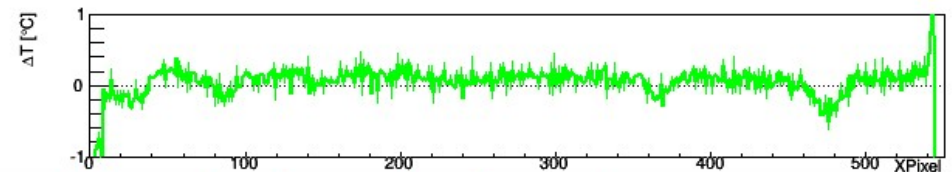
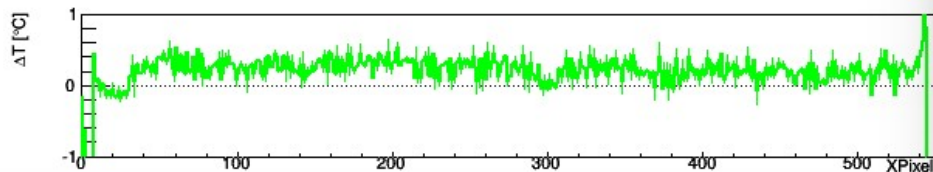
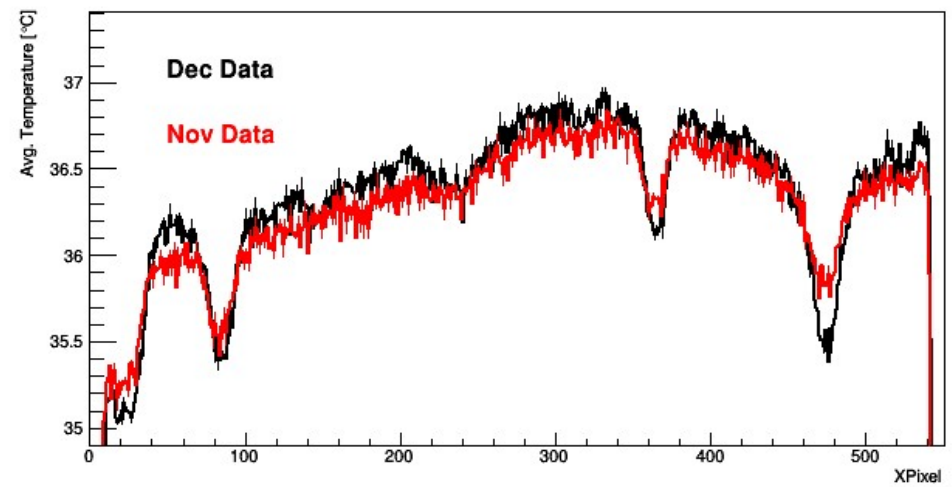
ypixel:xpixel {temp}



Input Line Average Temperature Pic1

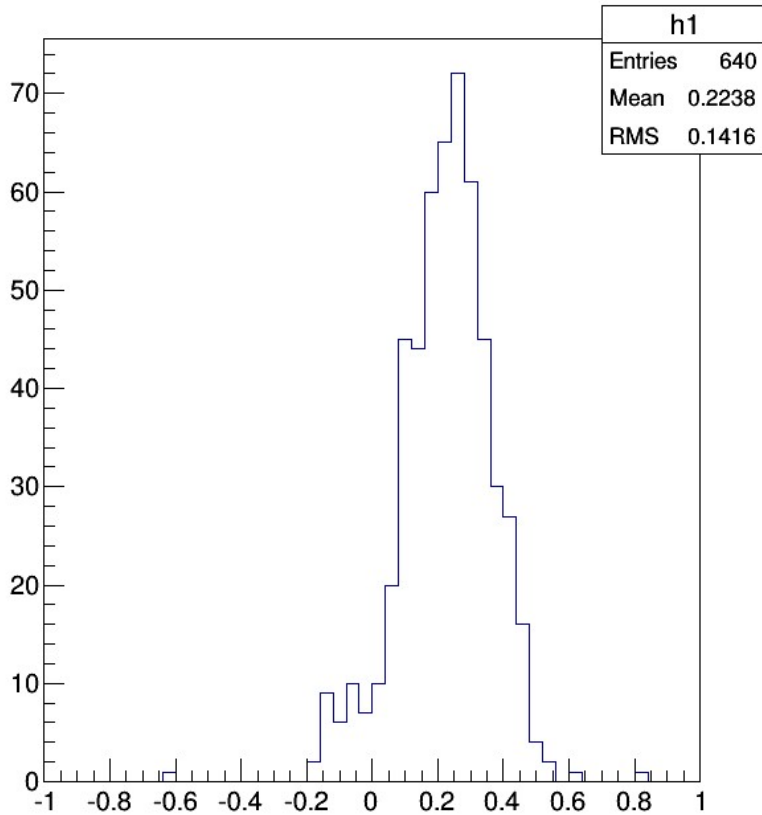


Output Line Average Temperature Pic1

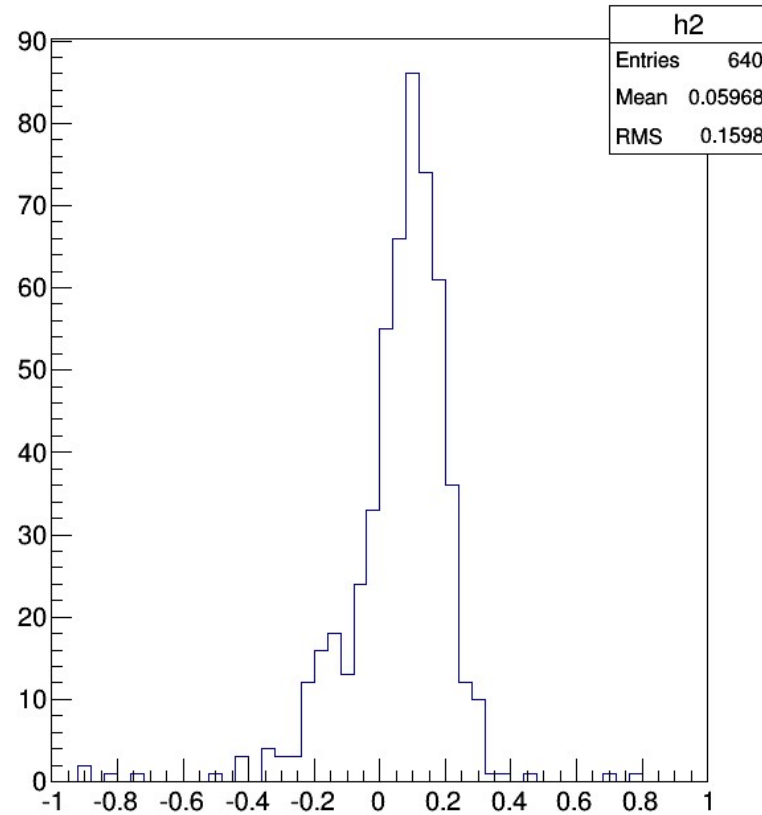


J-Side Difference Histograms

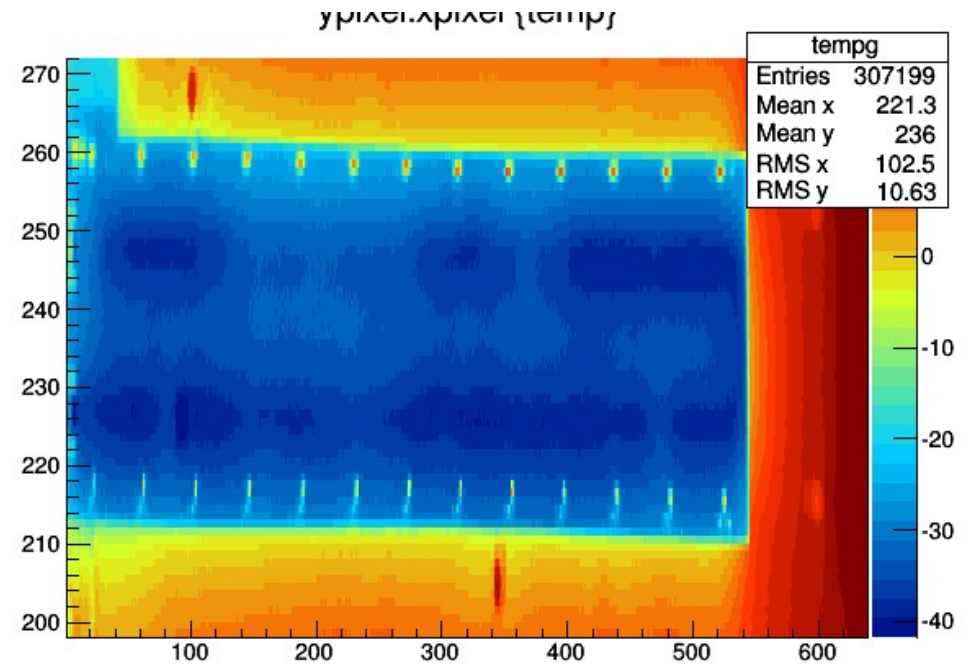
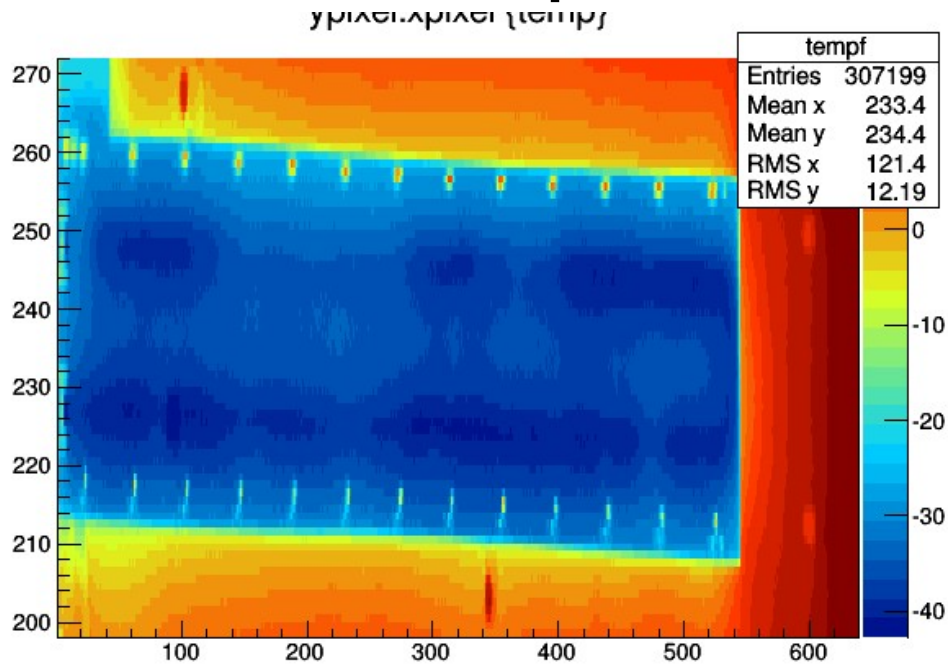
Temperature Difference Input Line



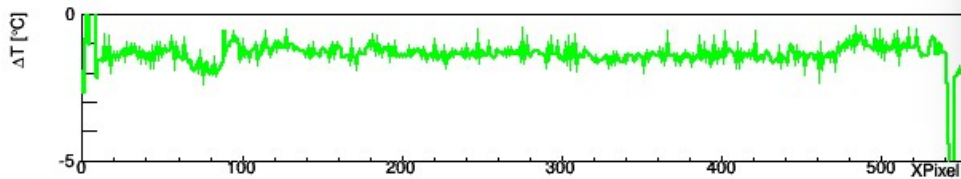
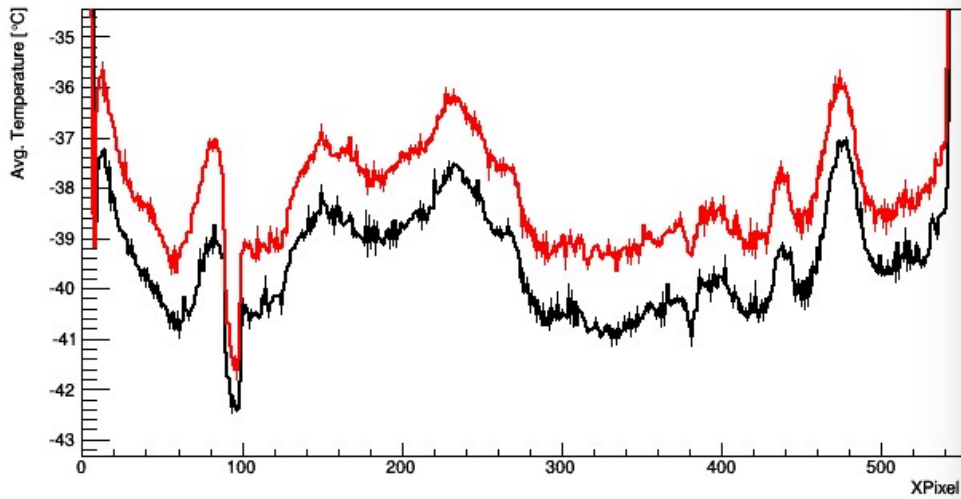
Temperature Difference Output Line



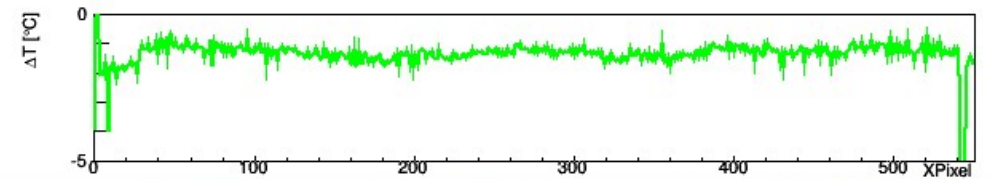
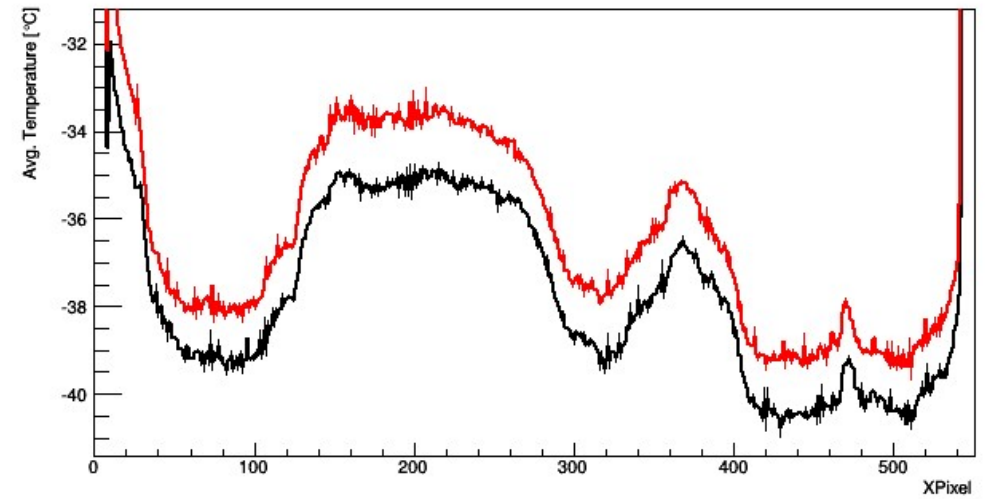
Low Temperature Measurements L-Side



Input Line Average Temperature Pic1

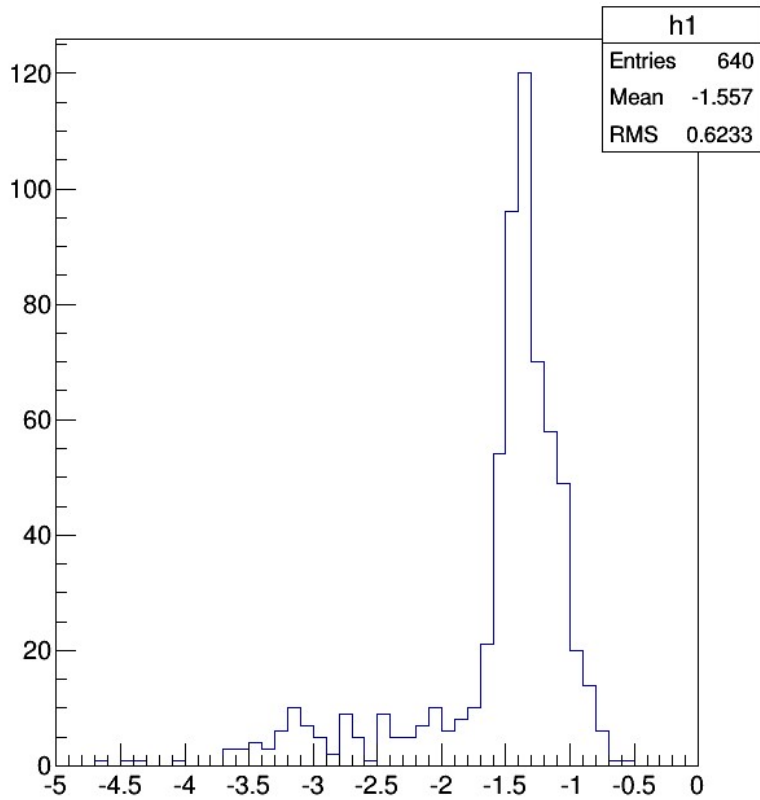


Output Line Average Temperature Pic1

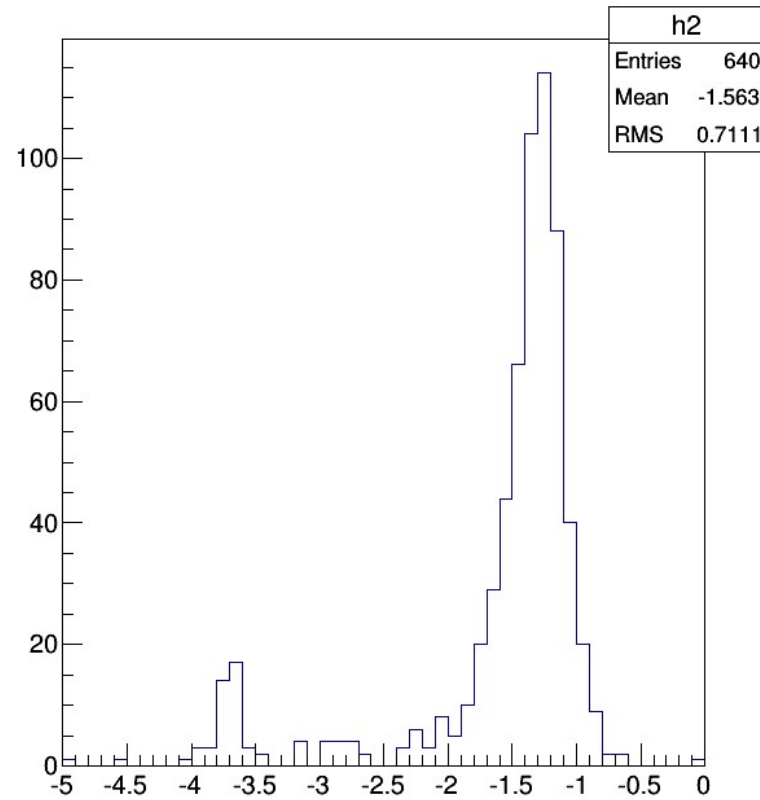


L-Side Difference Histograms

Temperature Difference Input Line

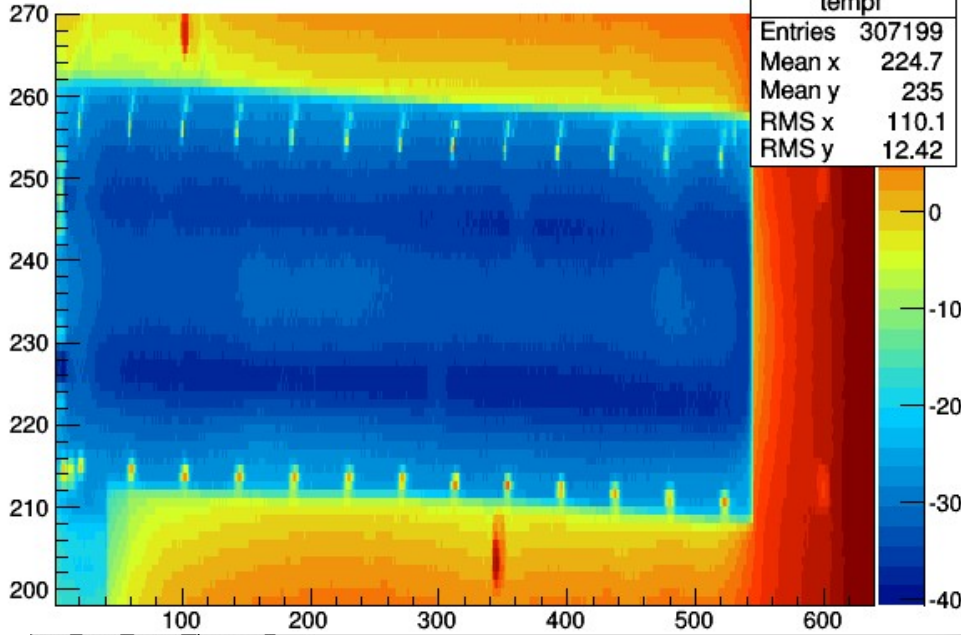


Temperature Difference Output Line

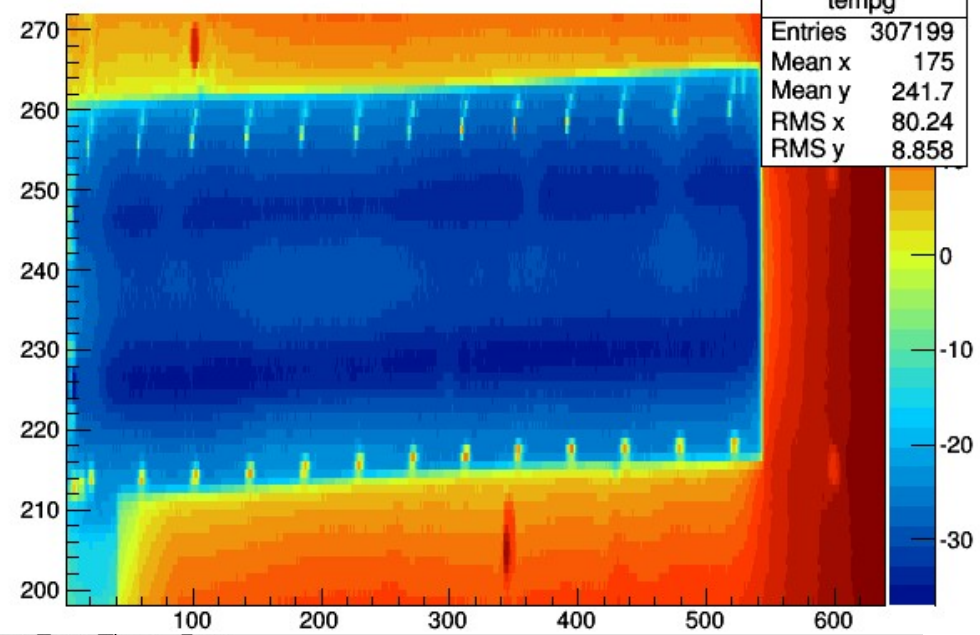


Low Temperature Measurements J-Side

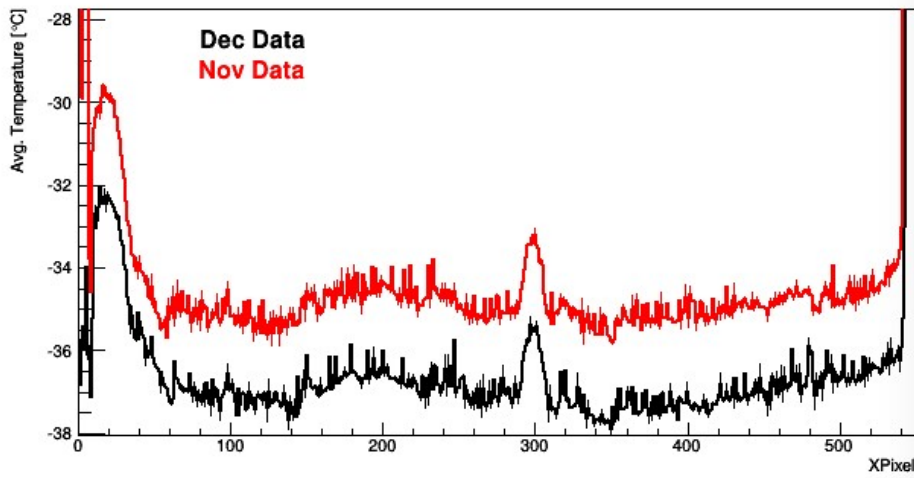
ypixel:xpixel {temp}



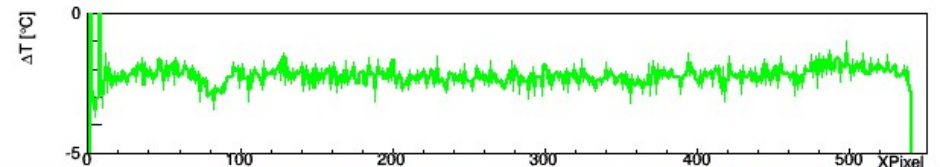
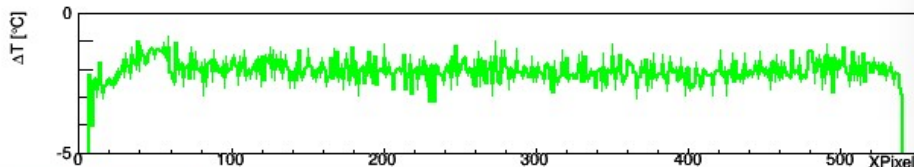
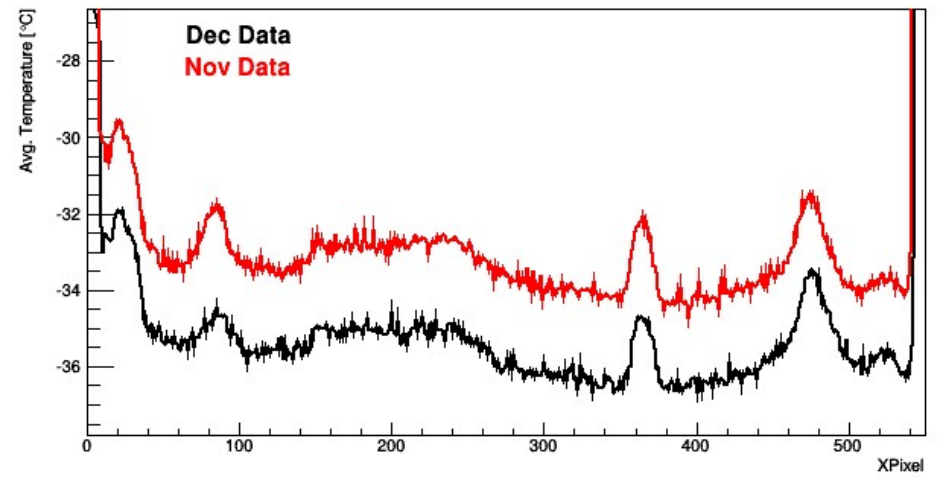
ypixel:xpixel {temp}



< Input Line Average Temperature Pic1

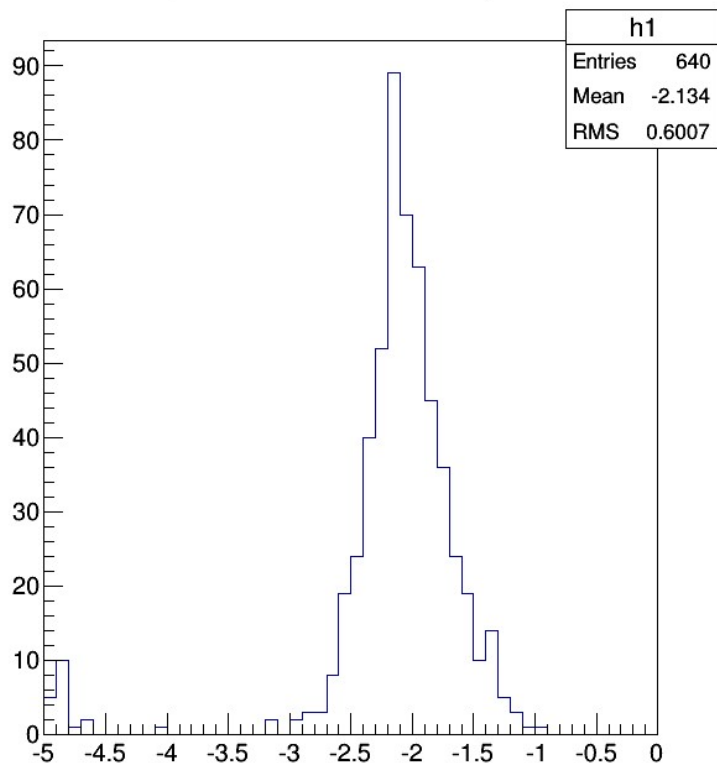


Output Line Average Temperature Pic1

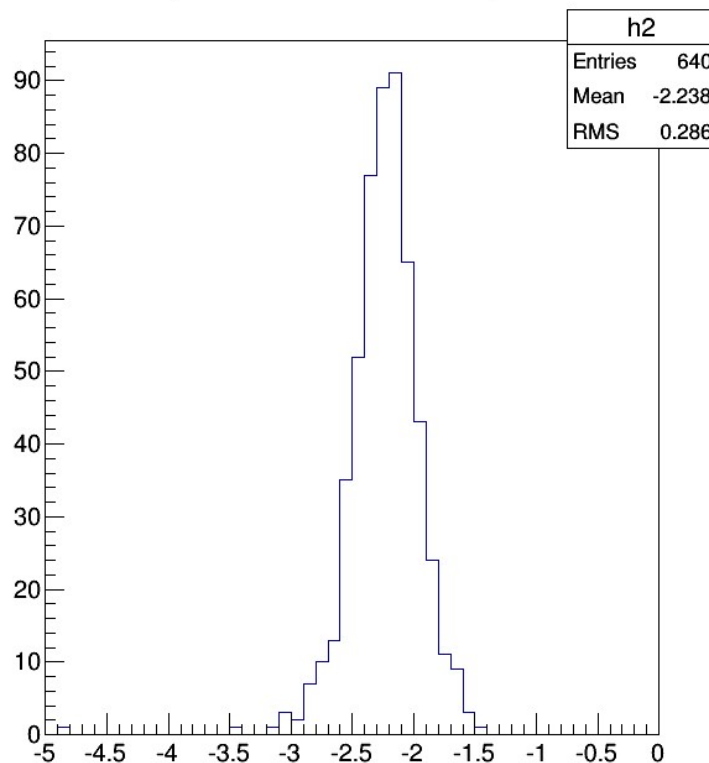


J-Side Difference Histograms

Temperature Difference Input Line



Temperature Difference Output Line

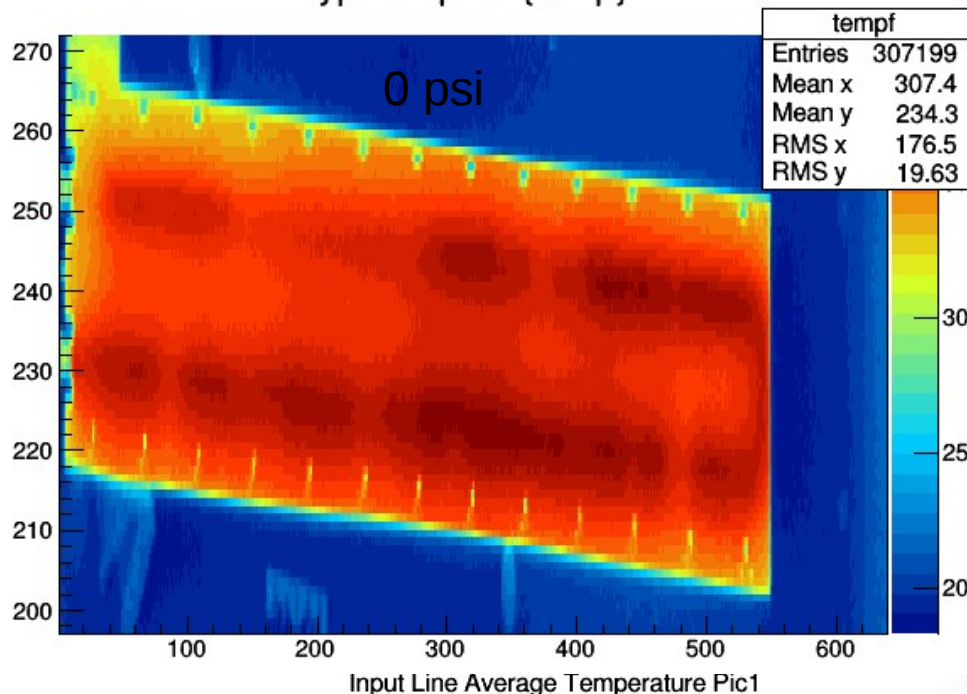


Pressurization Comparison

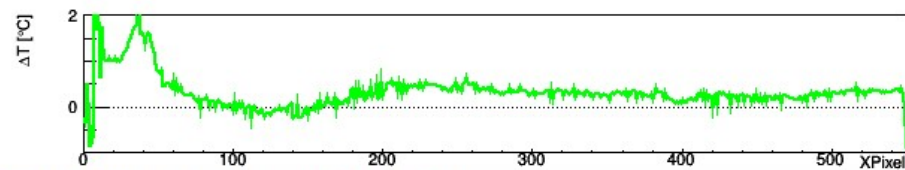
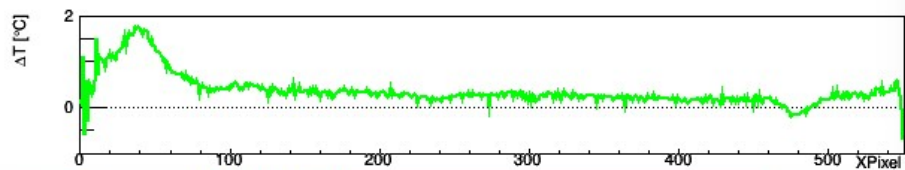
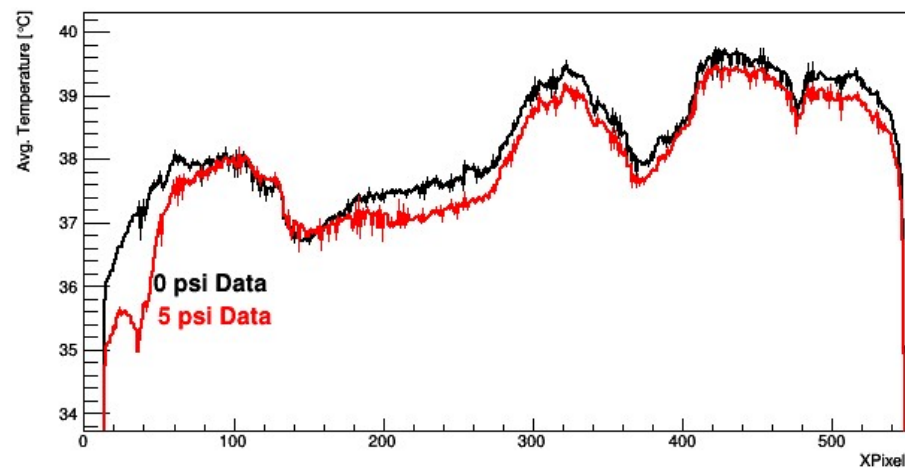
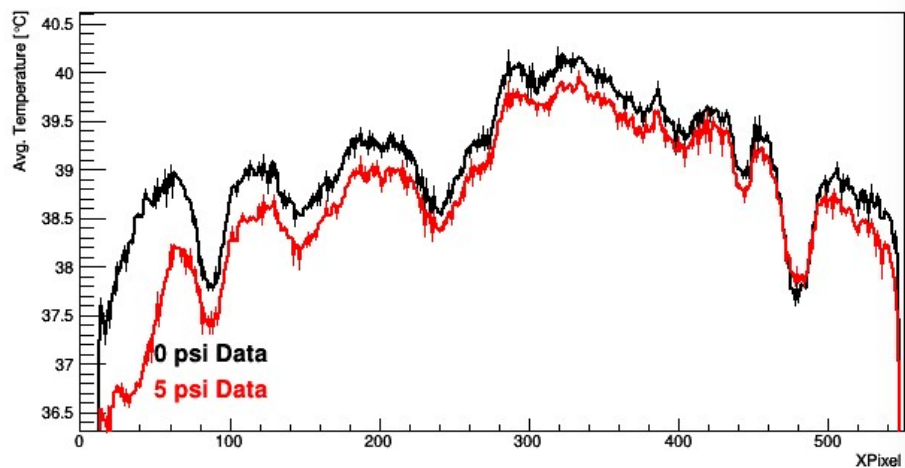
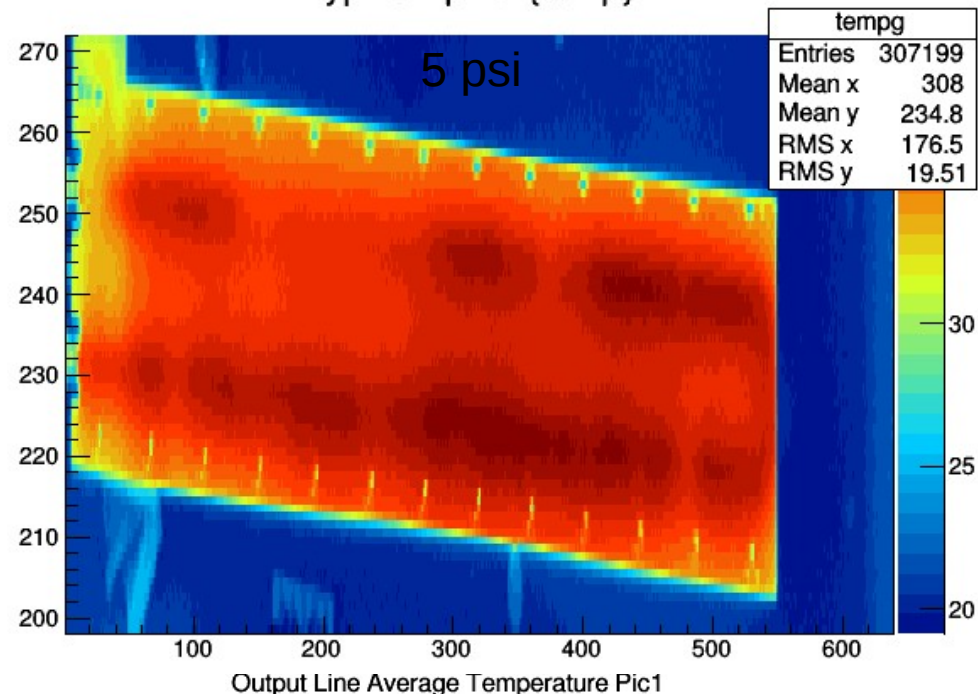
- Using the same program but with two different pressures inside the stave(0 psi and 5 psi).
- The averaged photos are from 200 frames taken with a 25 frames/sec rate.

Initial High Temperature Measurements Pressurizing L-Side

ypixel:xpixel {temp}

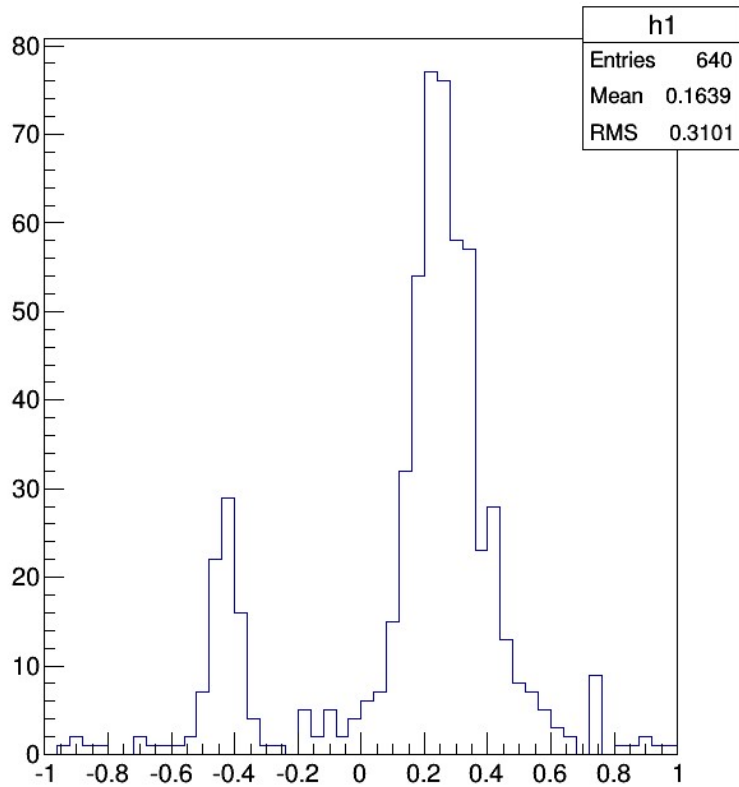


ypixel:xpixel {temp}

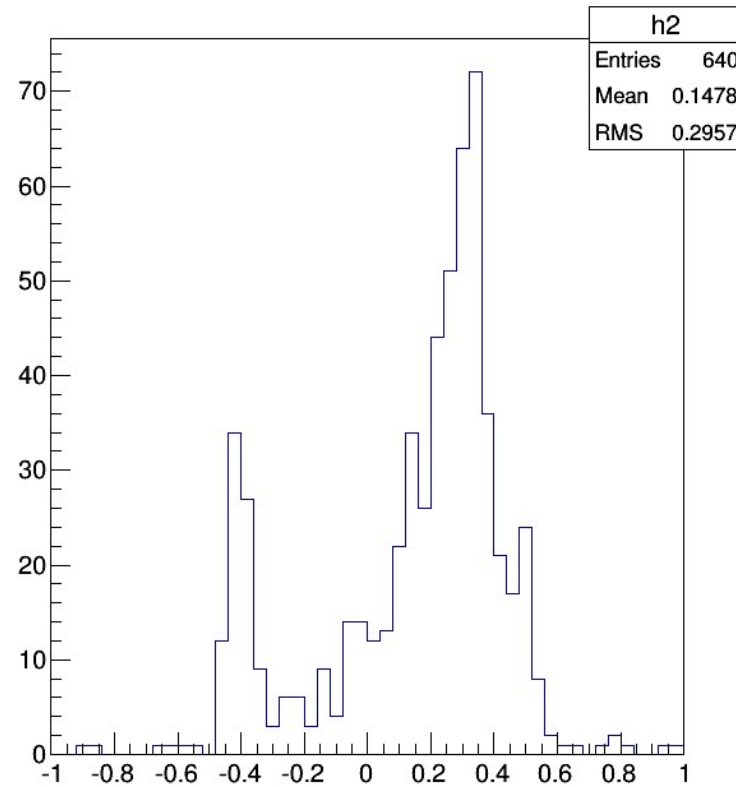


L-Side Difference Histograms

Temperature Difference Input Line



Temperature Difference Output Line



Conclusions and Future Work

- Image comparison shows that the images are very similar and their main difference is an offset between the two measurements. High Temperature measurements have a greater stability giving a smaller RMS 0.2 C. The Lower temperature measurements are less stable and have a higher RMS of around 0.6 C.
- No obvious conclusions can be seen with the first plots of the pressurization test. There seems to be a slight increase in the RMS of the plot but there is more data to look at.