# Evaluation of Vessel Hole Positions

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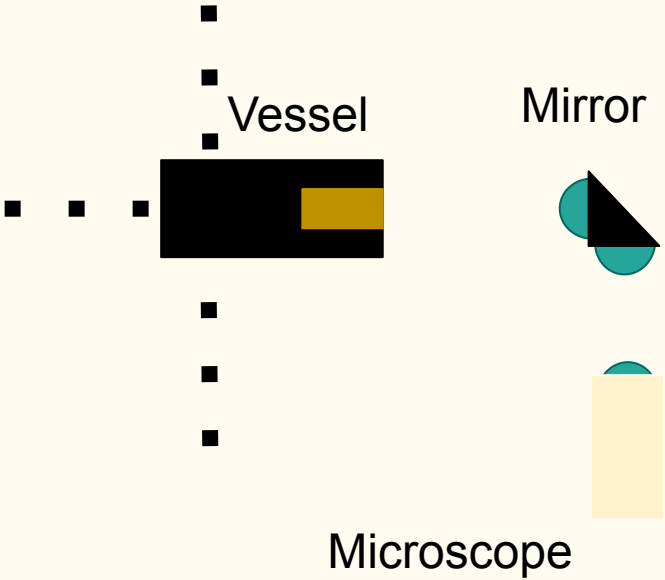
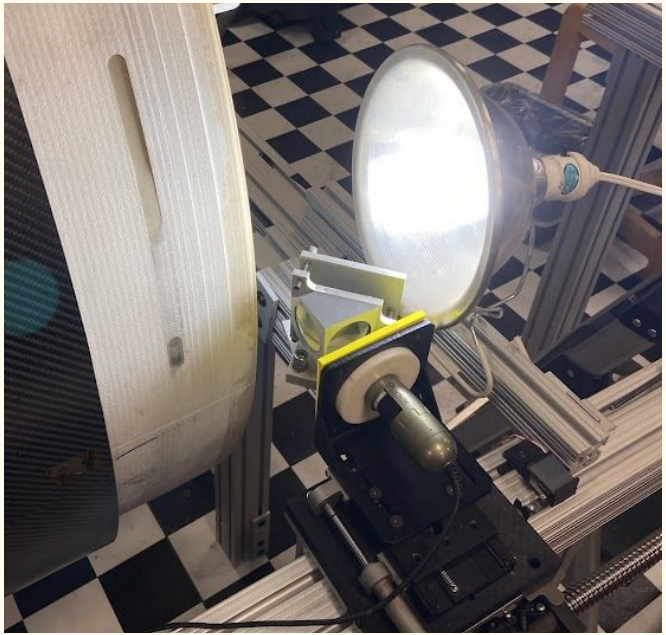
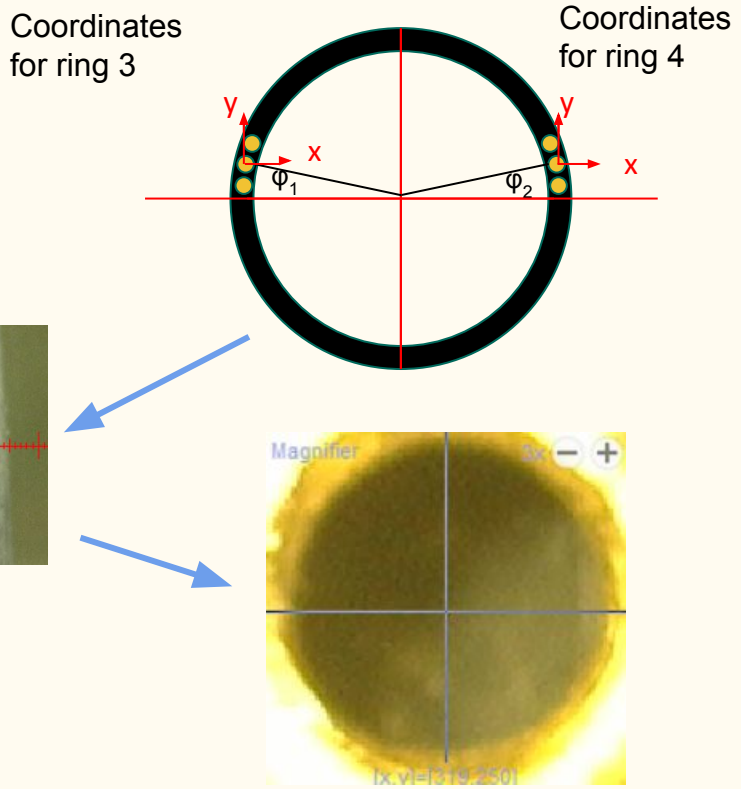
# Set up



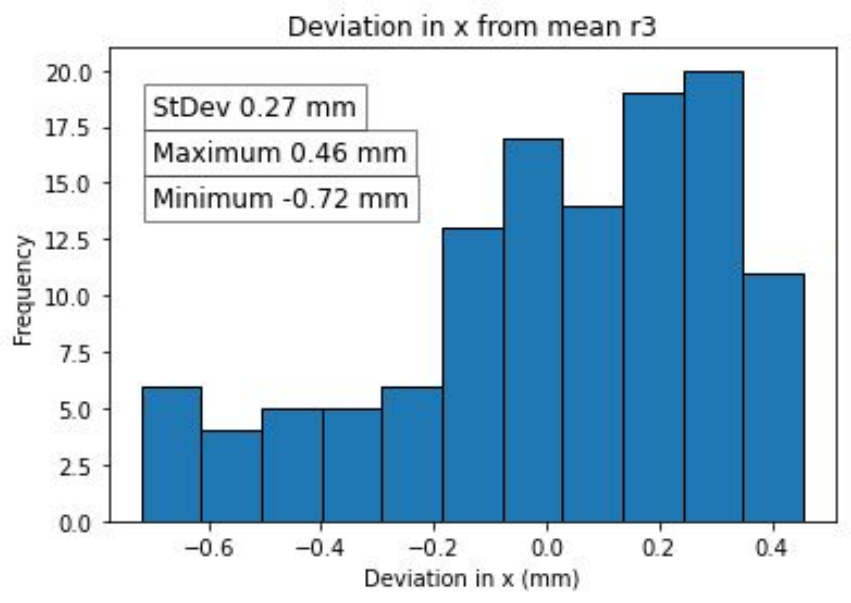



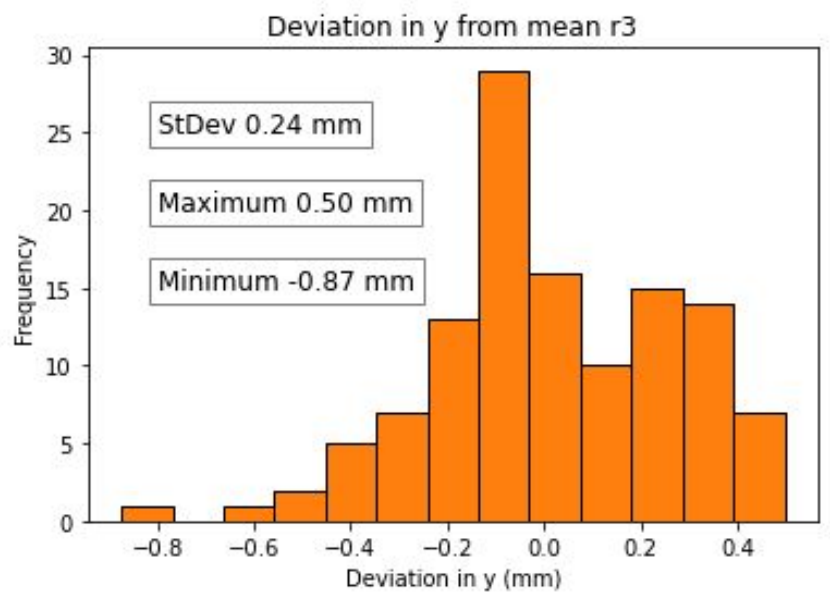
# Measurement

- Calibrate the microscope
- Center the microscope on one hole to avoid parallax
- Use a digital zoom and crosshair to estimate the x and y pixel value at the center of the hole.
- Rotate the mandrel by 1/120 of a revolution and find the central pixel value for the next hole
- repeated the process for all holes.
- Find the conversion from pixel to mm

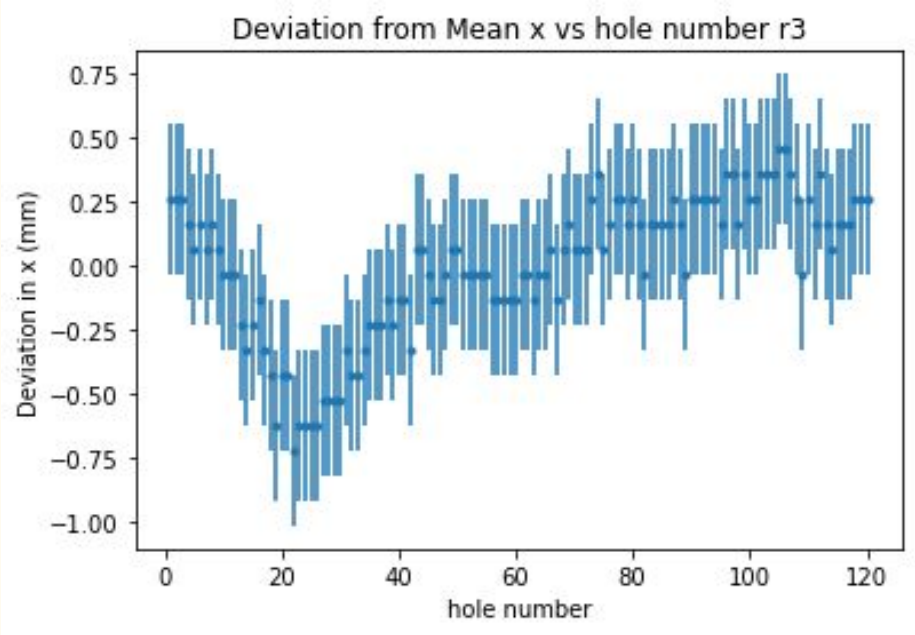


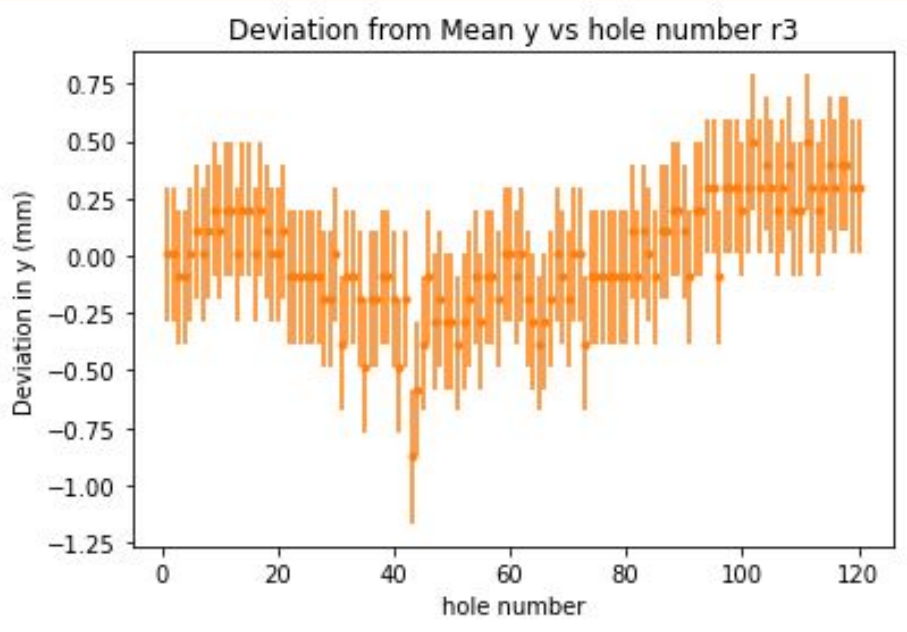
# Results for End RIng 3



# Data fro  End Ring 3

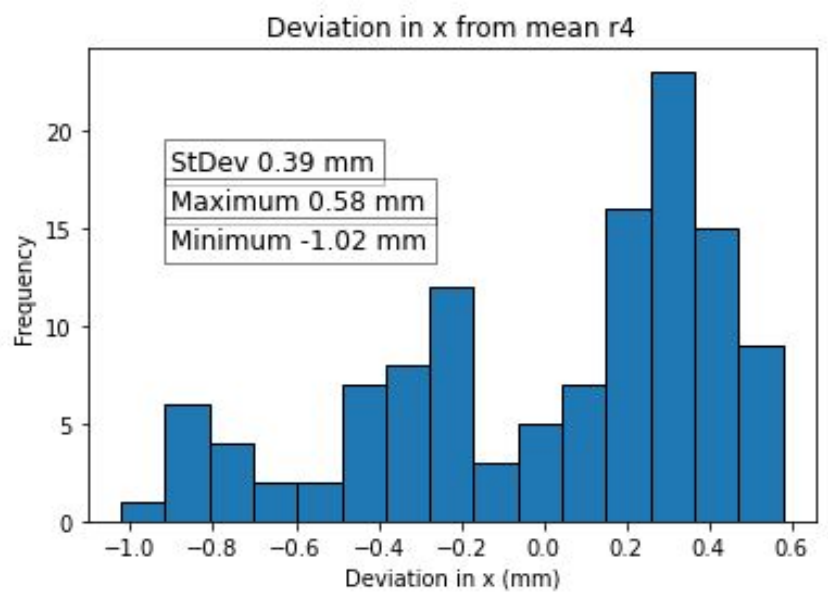


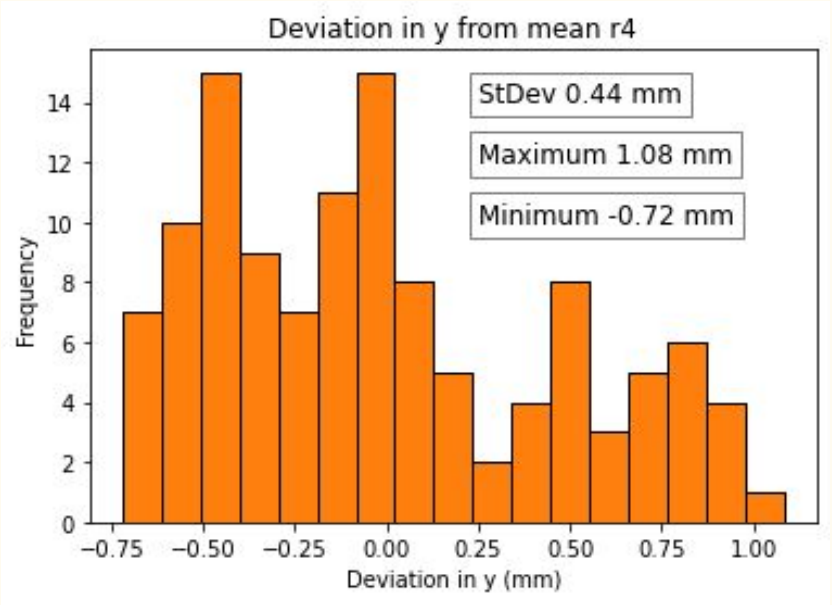




The error in determining the hole center is estimated to be +/- 3 pixels, this converts to about +/- 0.3 mm

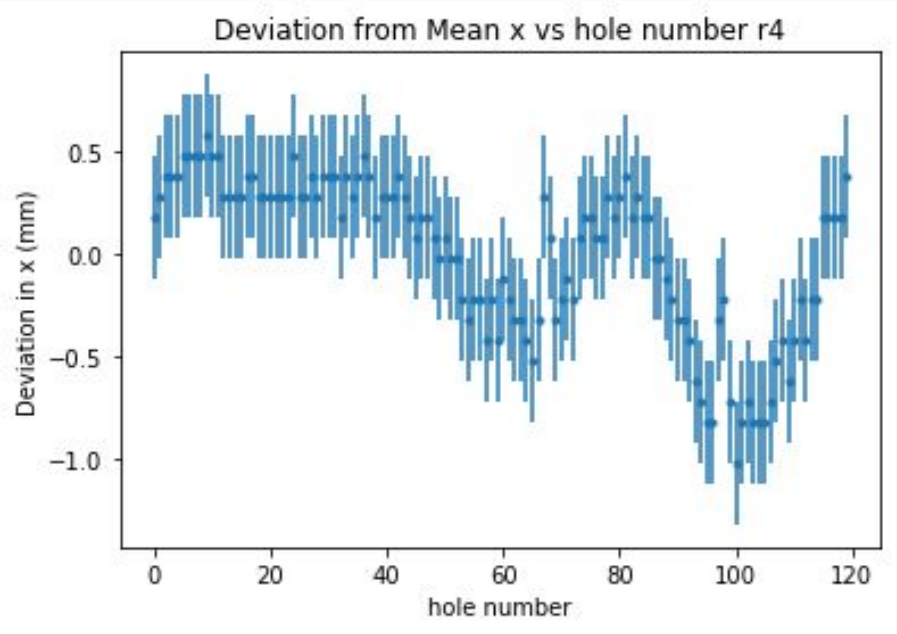
Other errors and uncertainties not currently considered. Data can be recollected if needed

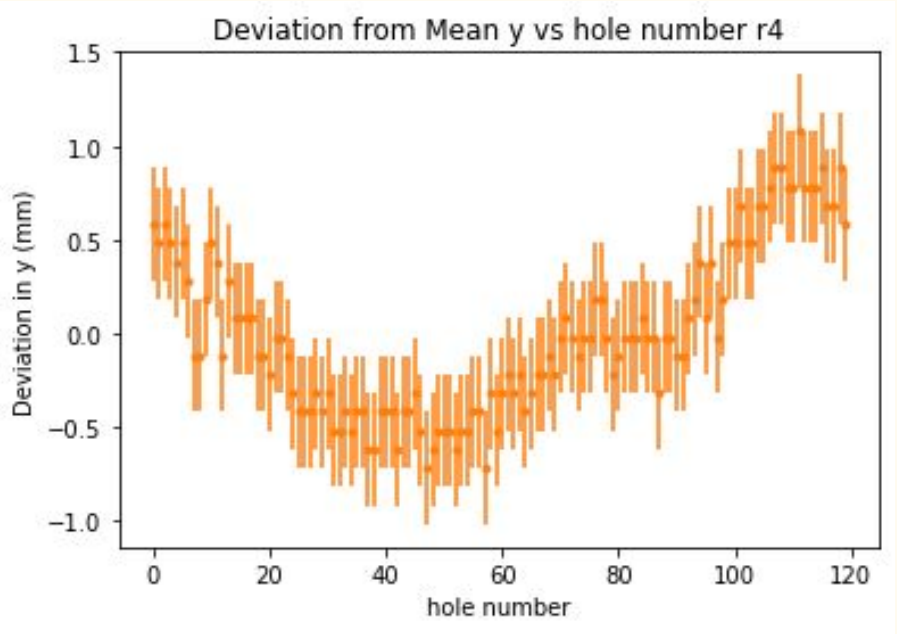
# Results for End Ring 4



# Data from End Ring 4

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