

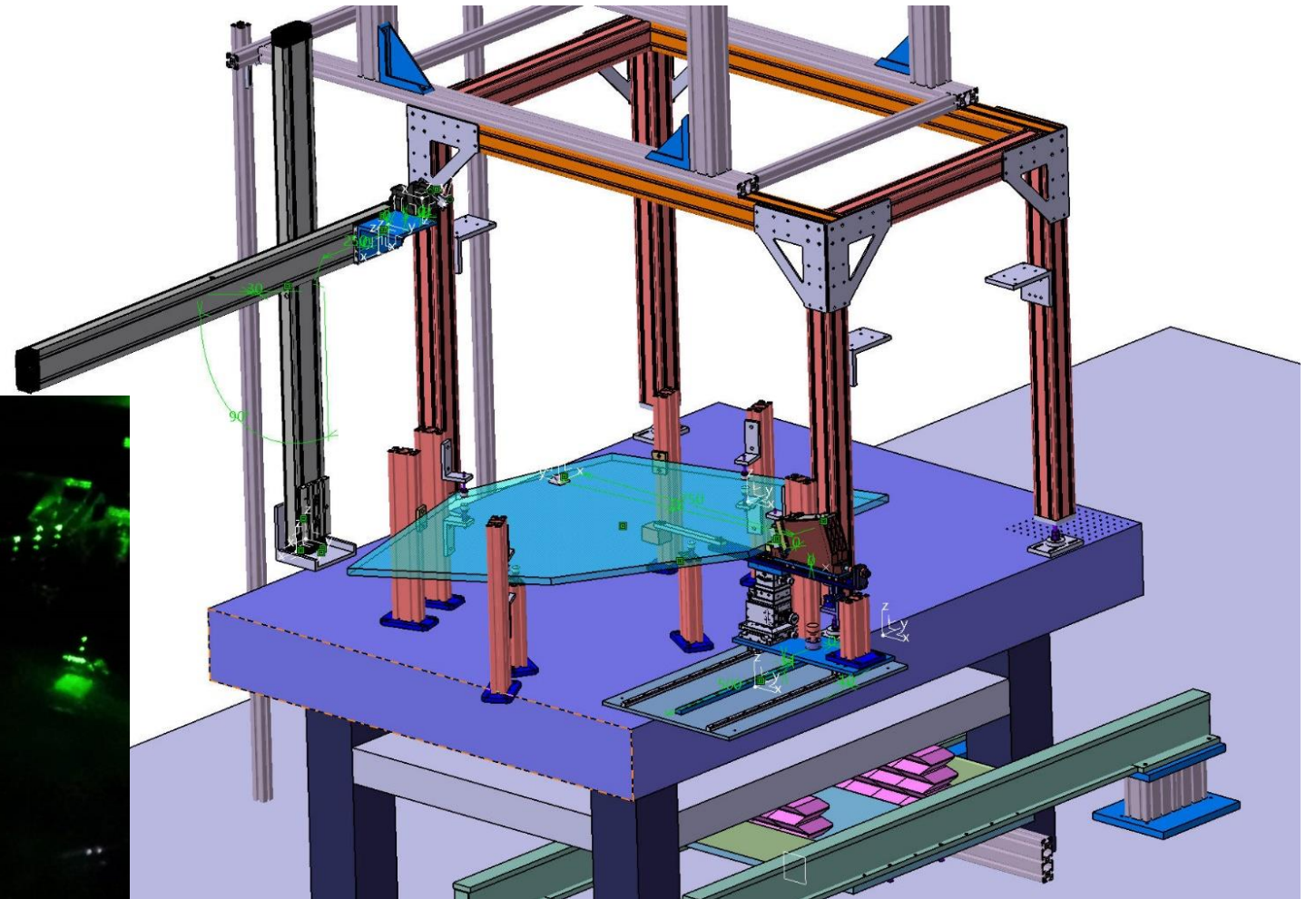
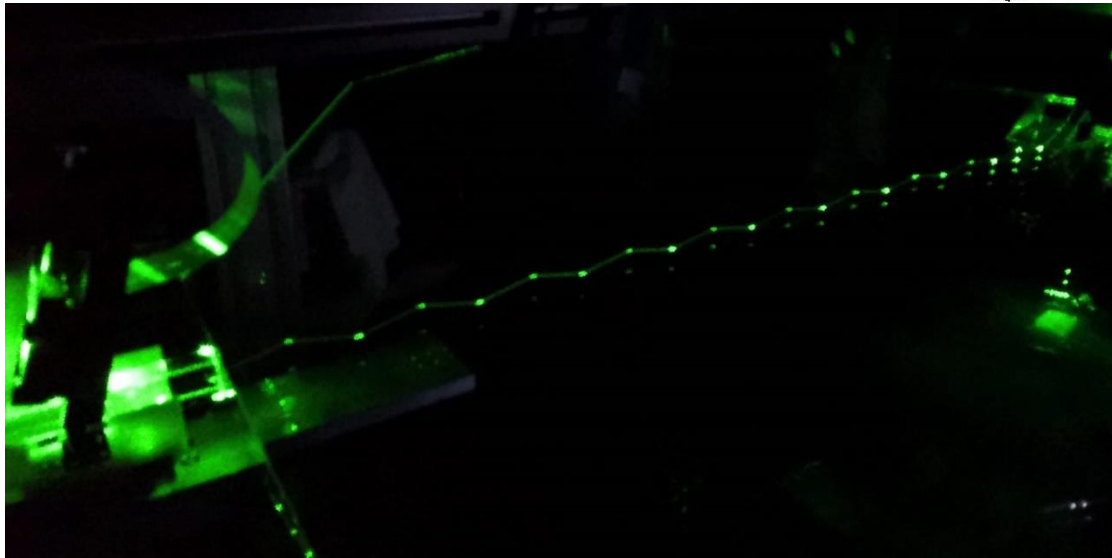
EDD Radiator Quality Measurements

PANDA CM 20/3 27.10.2020

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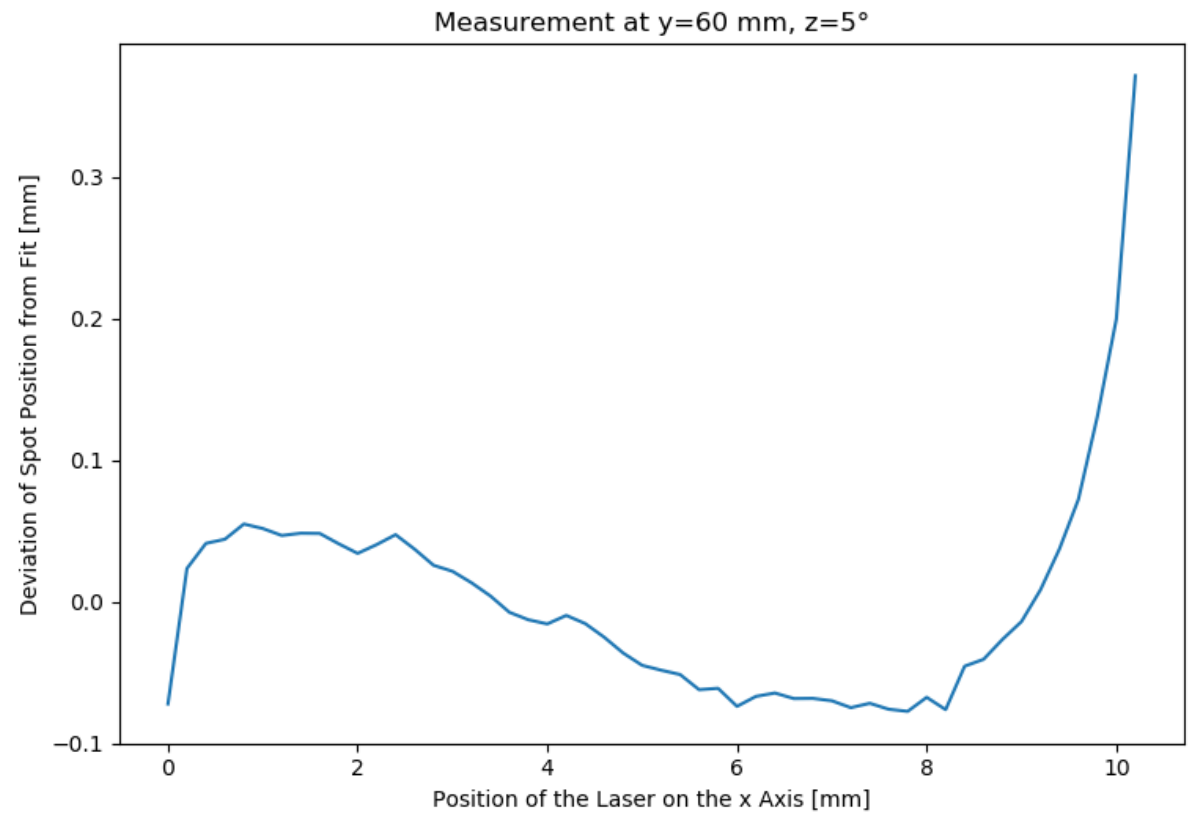
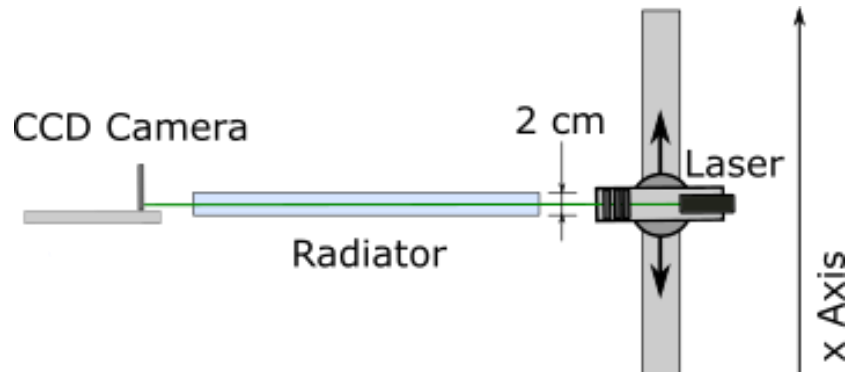
Setup in the Clean Room

- Fused silica quadrant and ROM on the optical table
- Cross of linear stages on the side of the table



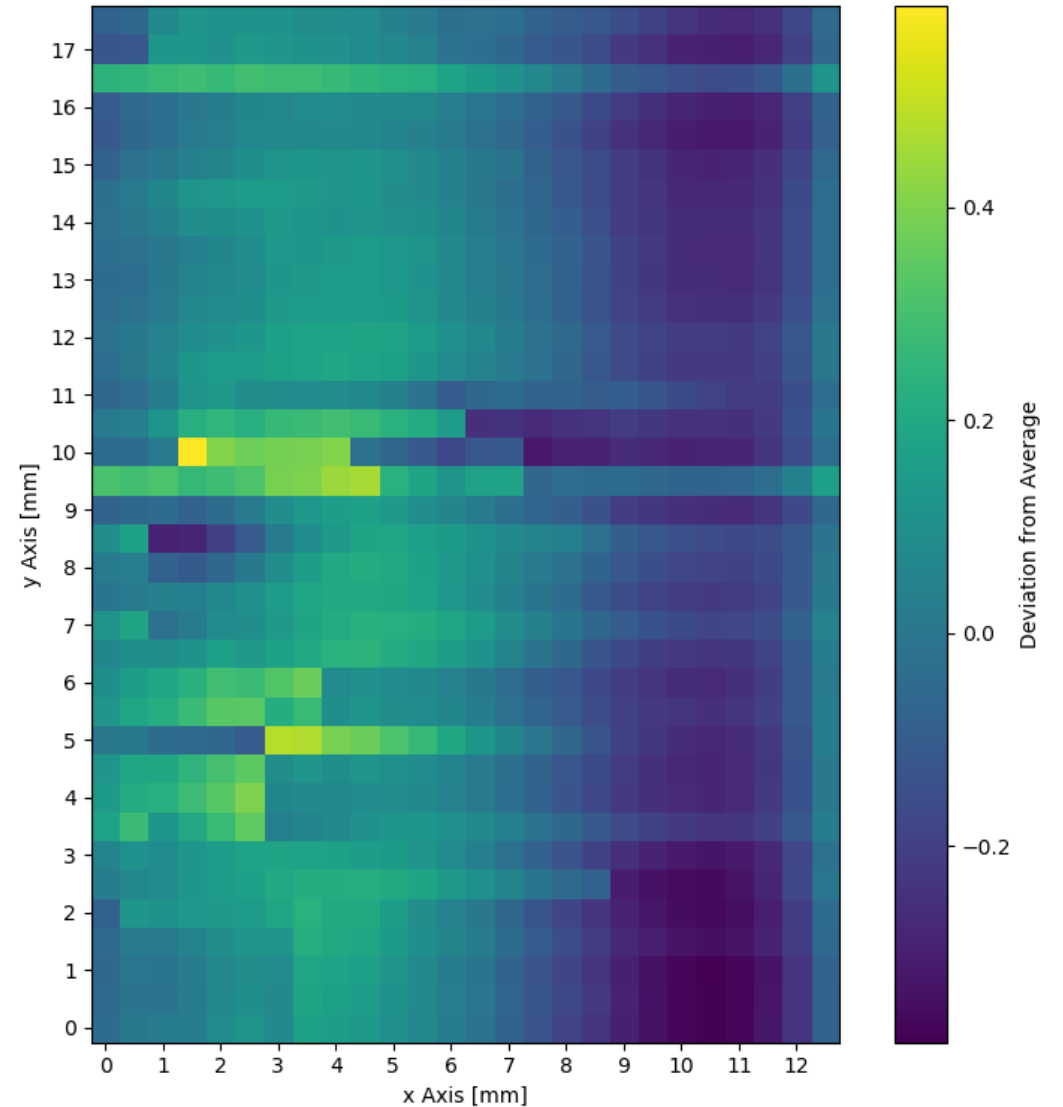
Vertical Scan (x axis)

- Laser is moved on the x axis
- Spot position is measured with the CCD camera
- Deviation of the position from a linear fit is plotted



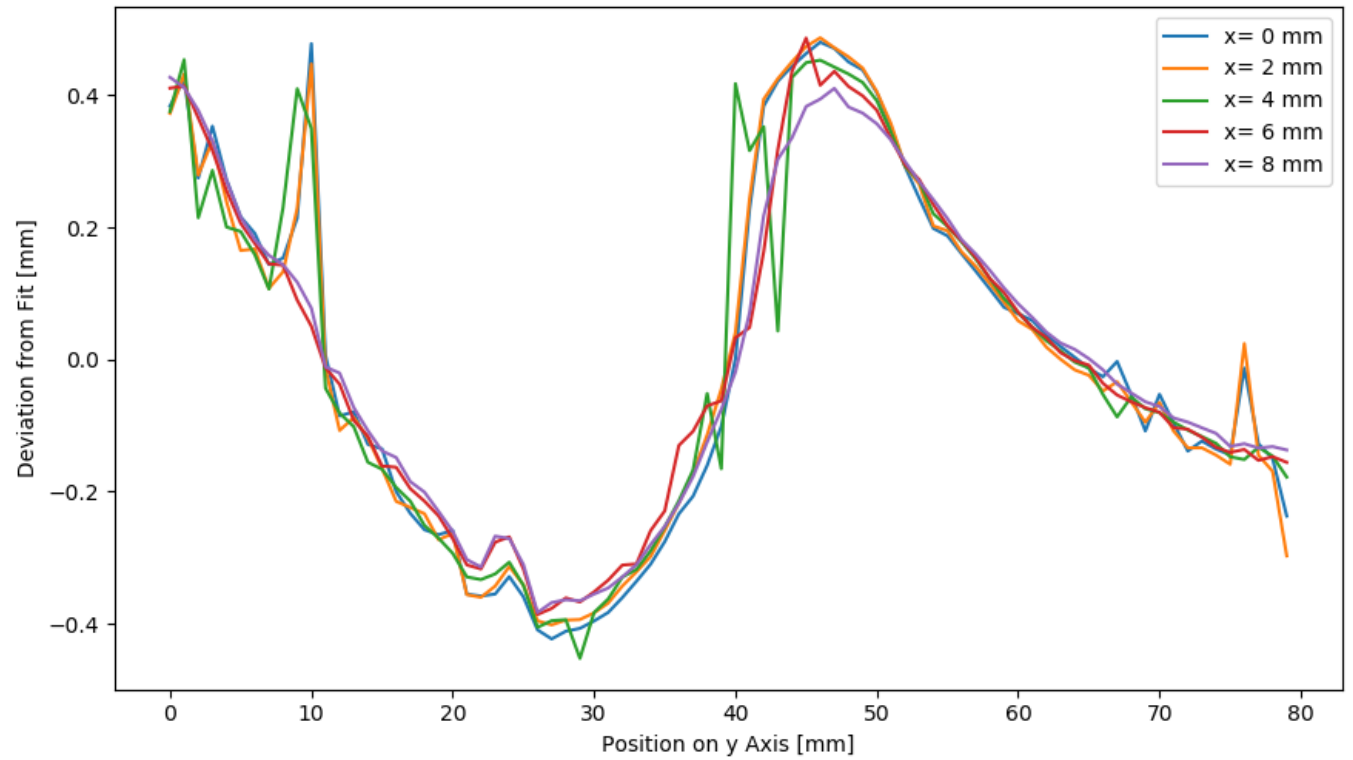
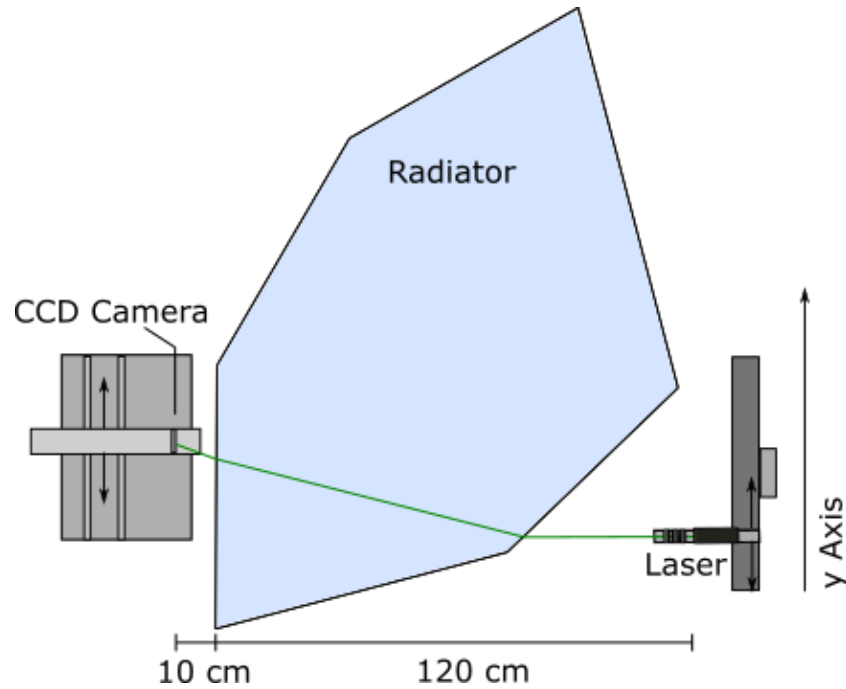
Heatmap

- Several vertical scans are taken
 - After each the laser is moved 0.5 mm on the y axis
- The Heatmap shows the deviation of the spot position from a linear fit



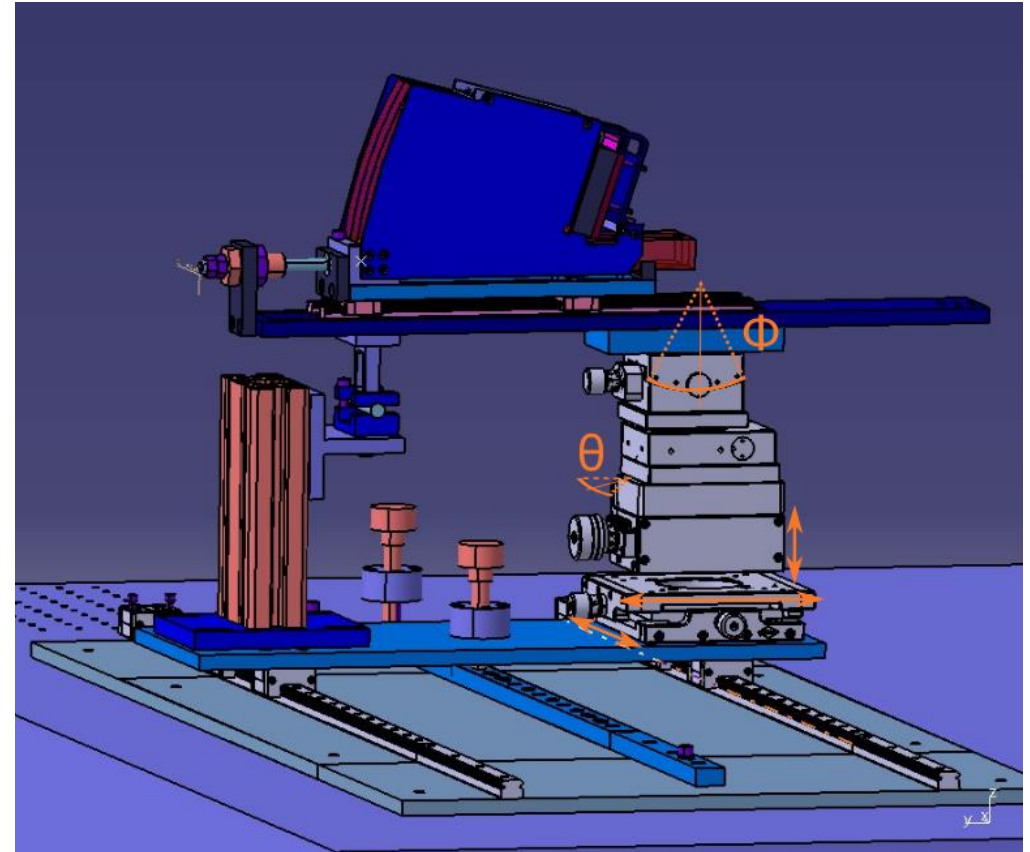
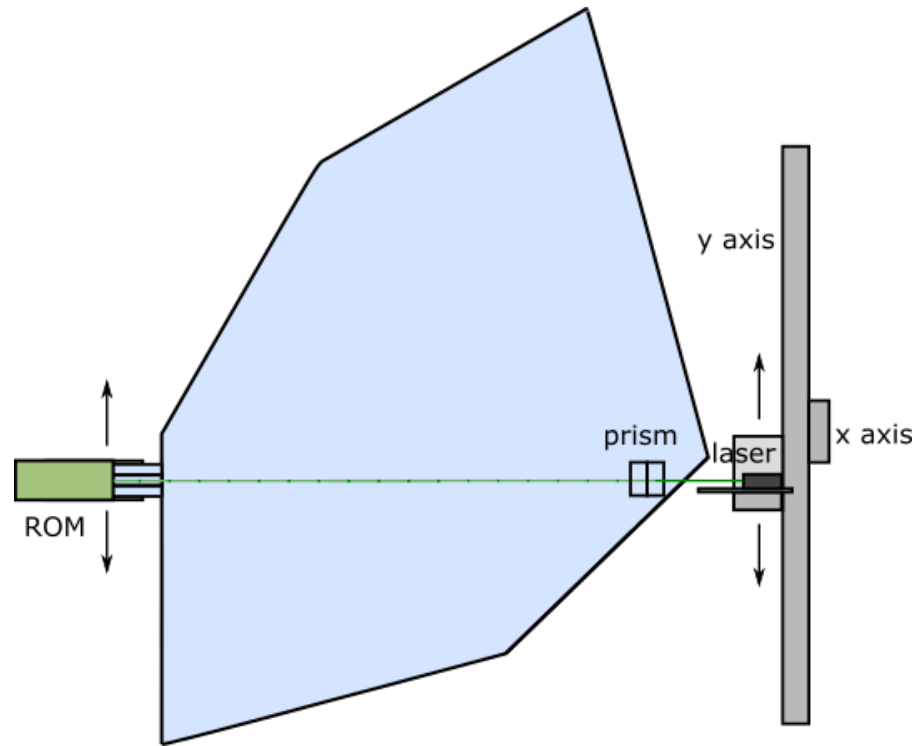
Horizontal Scan (y axis)

- The plot shows the deviation of the spot position from a linear movement



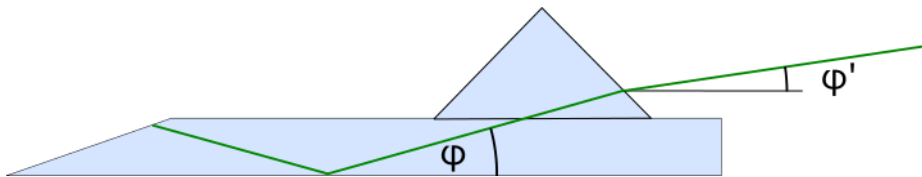
Setup with FELs and Gluing Station

- CCD camera is now mounted in front of the ROM

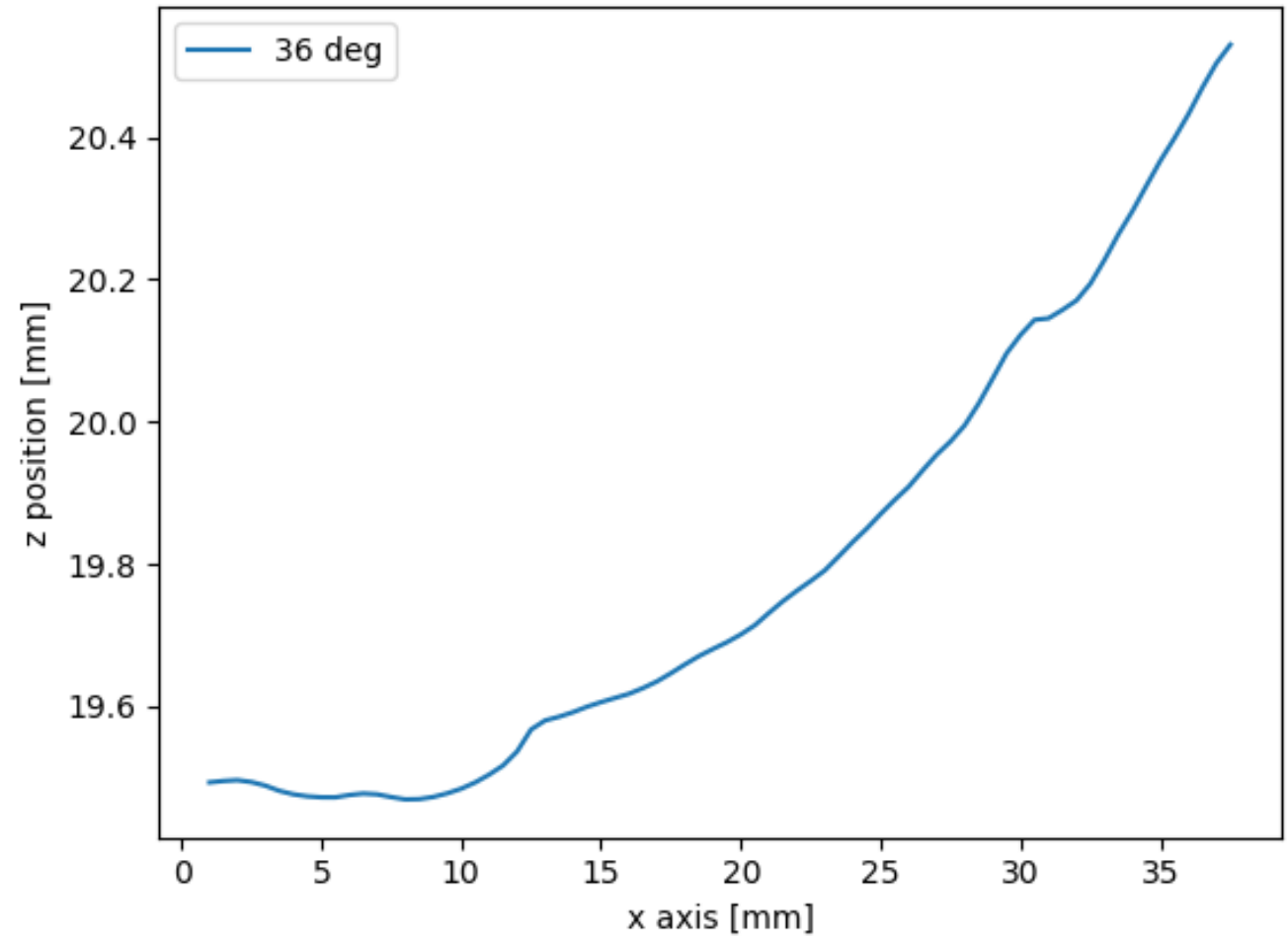


Measurement with FELs

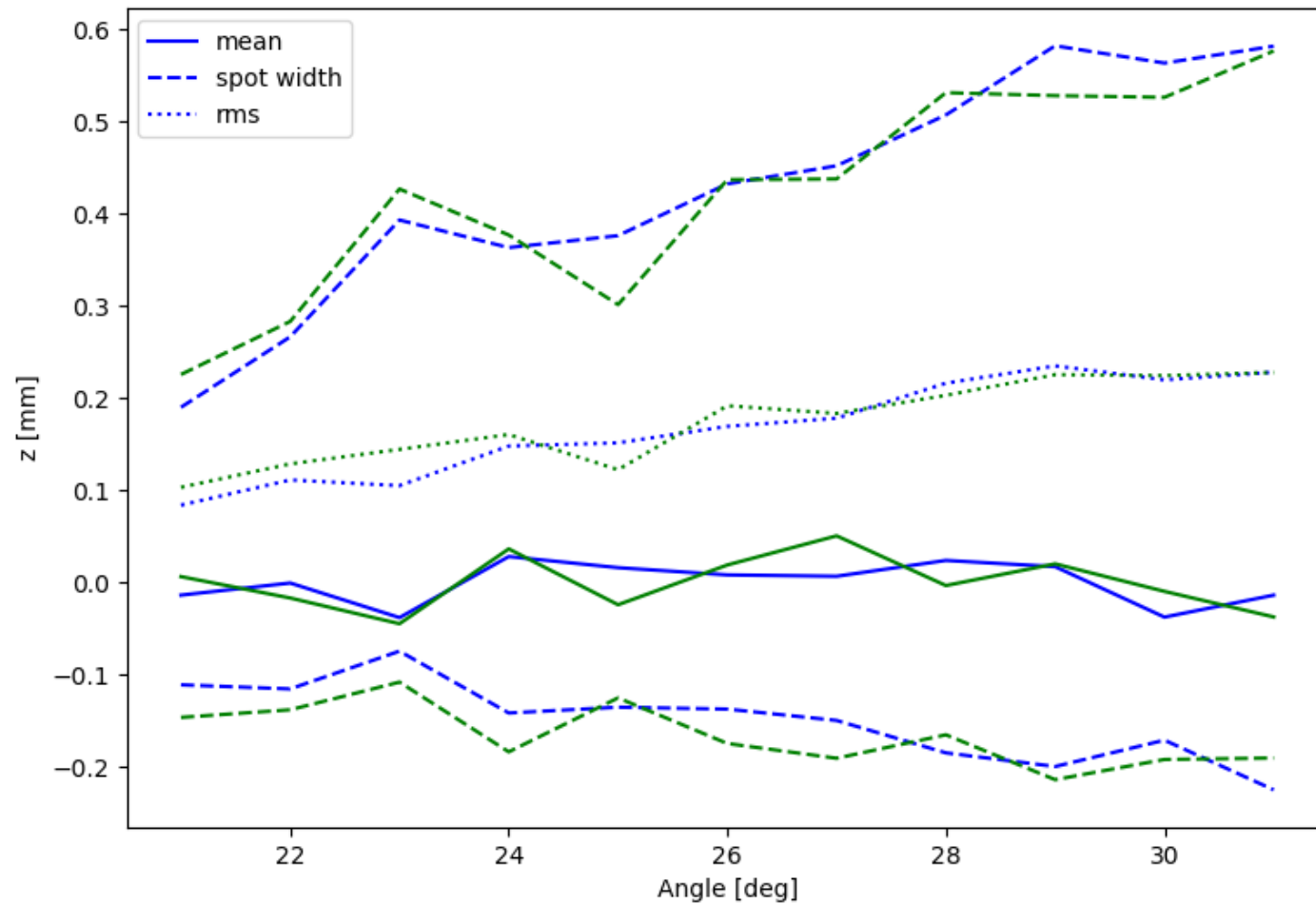
- The spot position on the CCD camera is measured for several angles between $\varphi=21^\circ$ and $\varphi=41^\circ$
- For each angle this results in a parabola
 - Caused by the optical error of the FEL



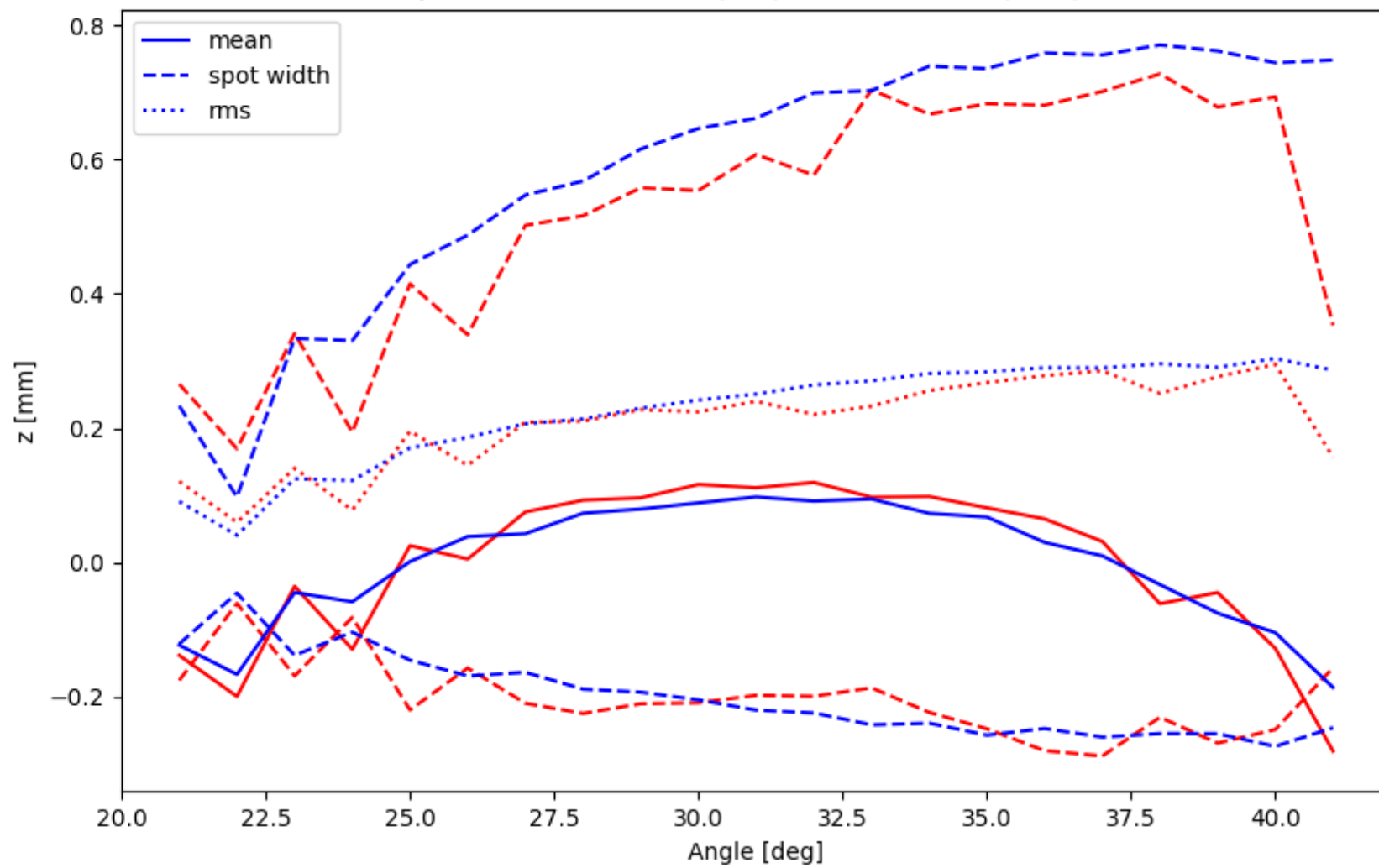
- An example of a measured parabola



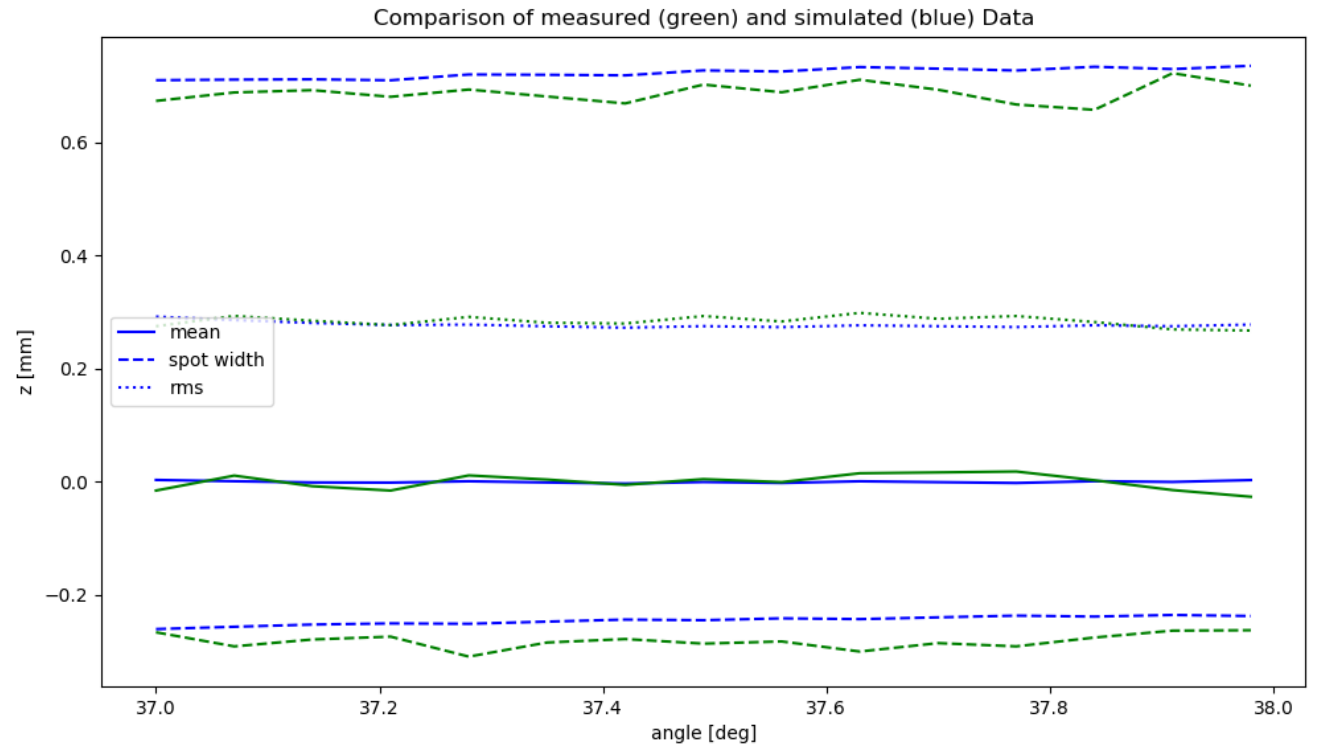
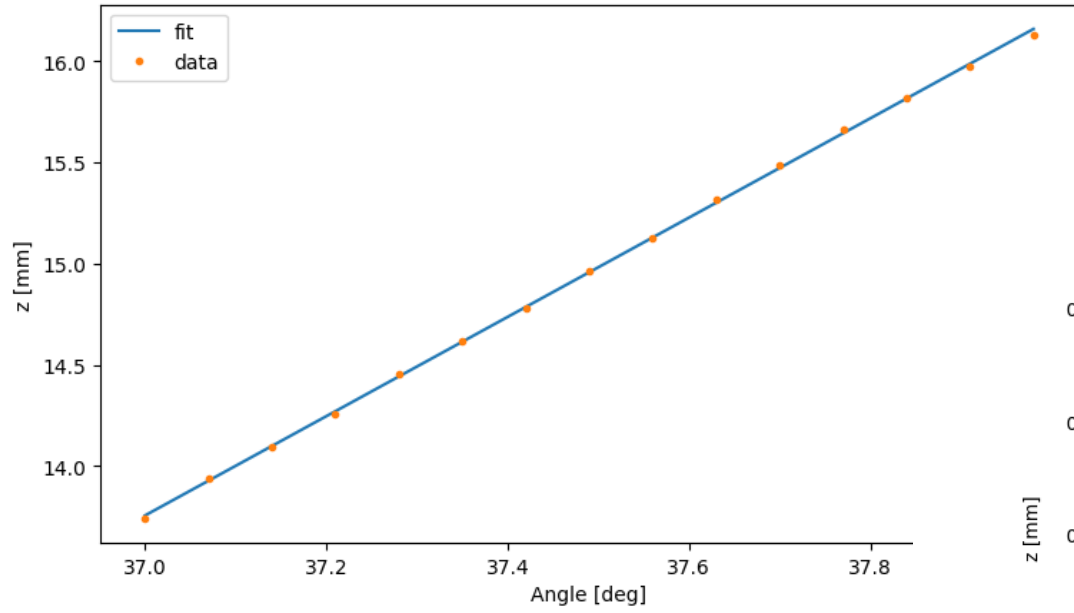
Comparison of measured (green) and simulated (blue) Data



Comparison of measured (red) and simulated (blue) Data

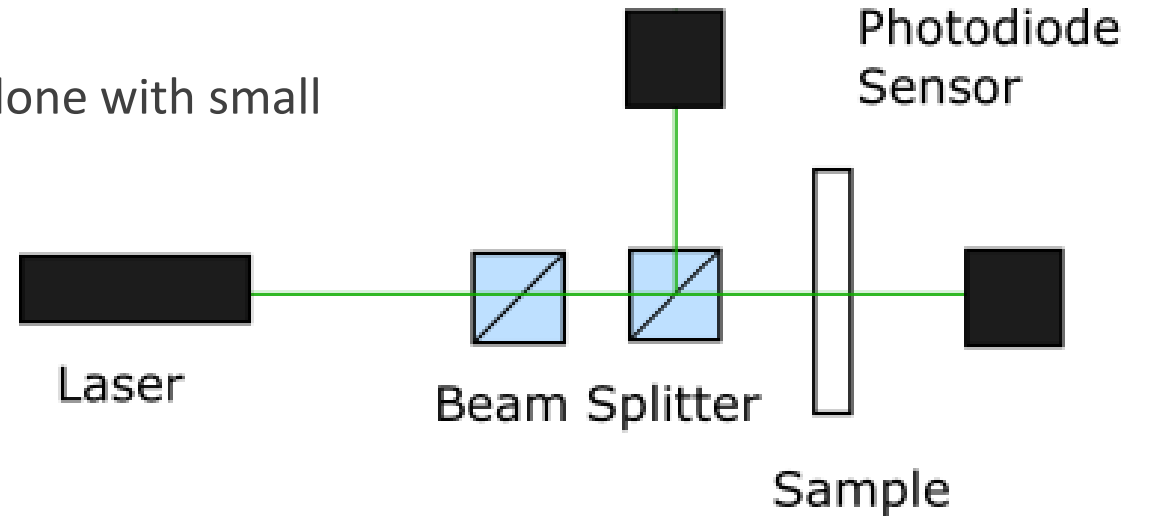


Fine Angle Scan



Ongoing Transmission Measurements

- Currently studying the effect of optical grease and glue on the connection
 - Possibly even out scratches
 - Reduce photon loss
- To protect the radiator and FELs the first tests are done with small fused silica plates



Conclusion/ Outlook

- Measurements without FELs indicated that light passing through the radiator is slightly deflected
- This effect is most likely caused by irregularities at the sides of the radiators
 - Some defects are visible on the edge
 - The measurements with FELs showed good results
- Even small angles can be separated
- Transmission measurements
 - Will show the effect of defects on photon loss
 - And how well it can be compensated

Thank you for your attention!