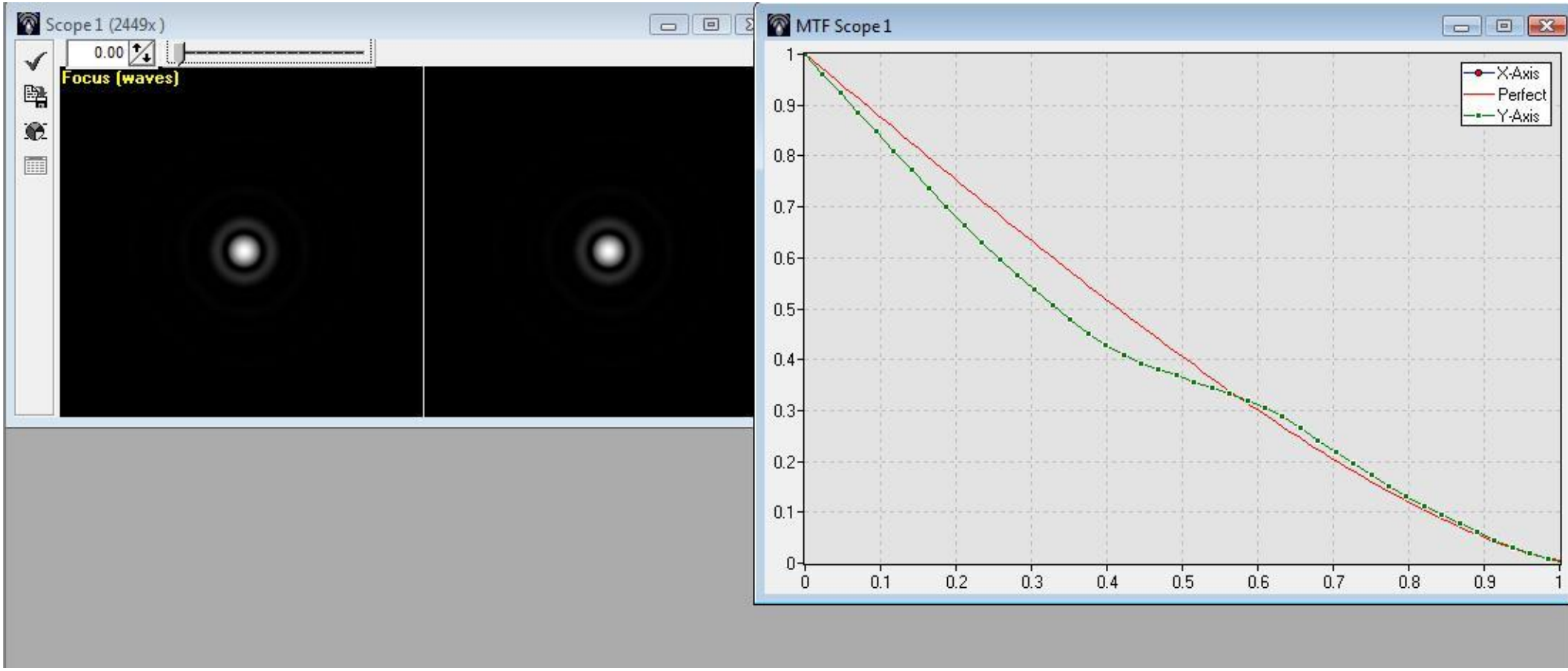
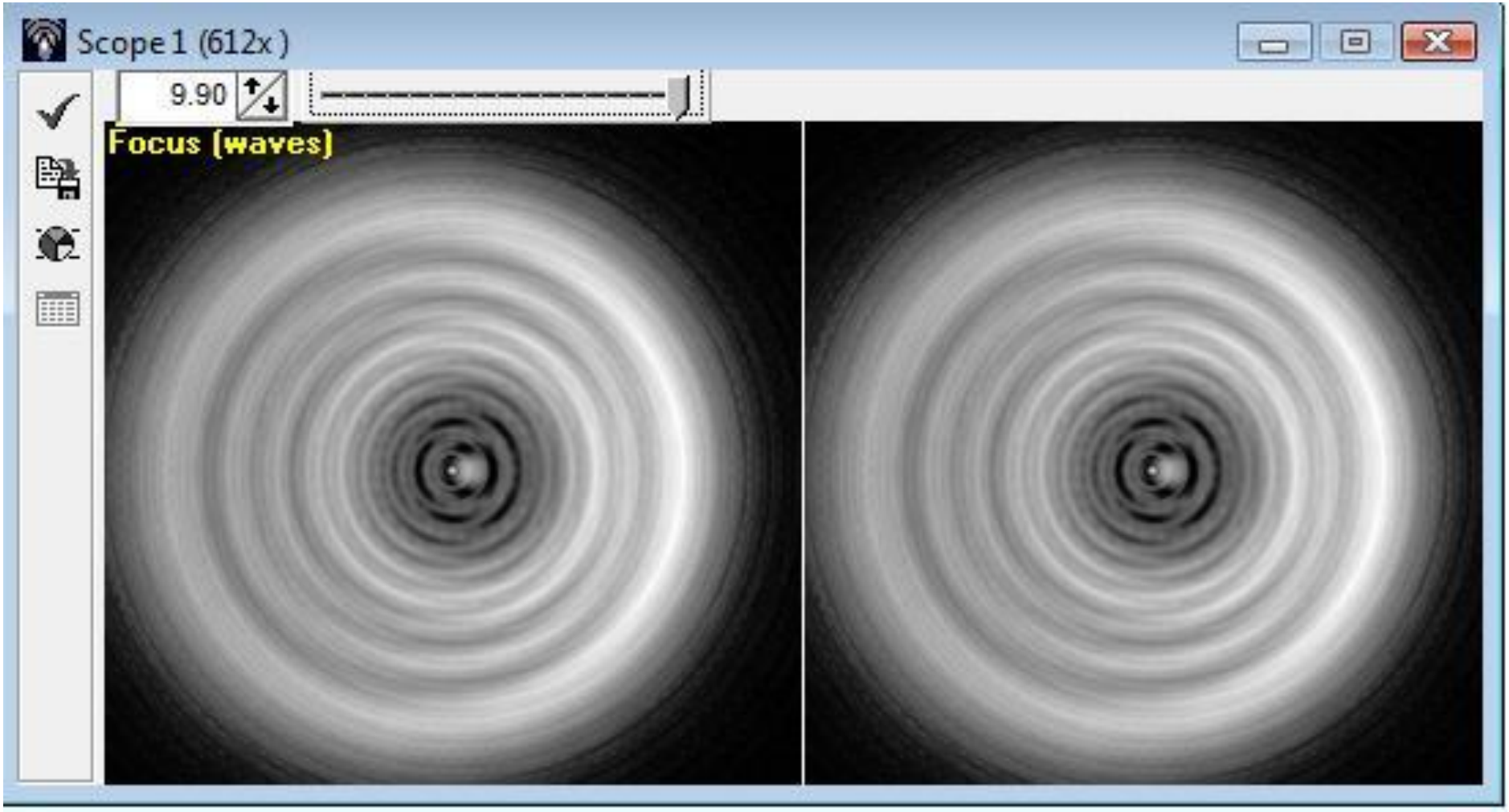
Collimating an SCT

- Common Misconceptions:
  - SCT's don't loose collimation
  - Not as important due to the long focal length
  - Collimating is hard
- Some “horror” stories about bad SCT's are likely due to mis-collimated optics.

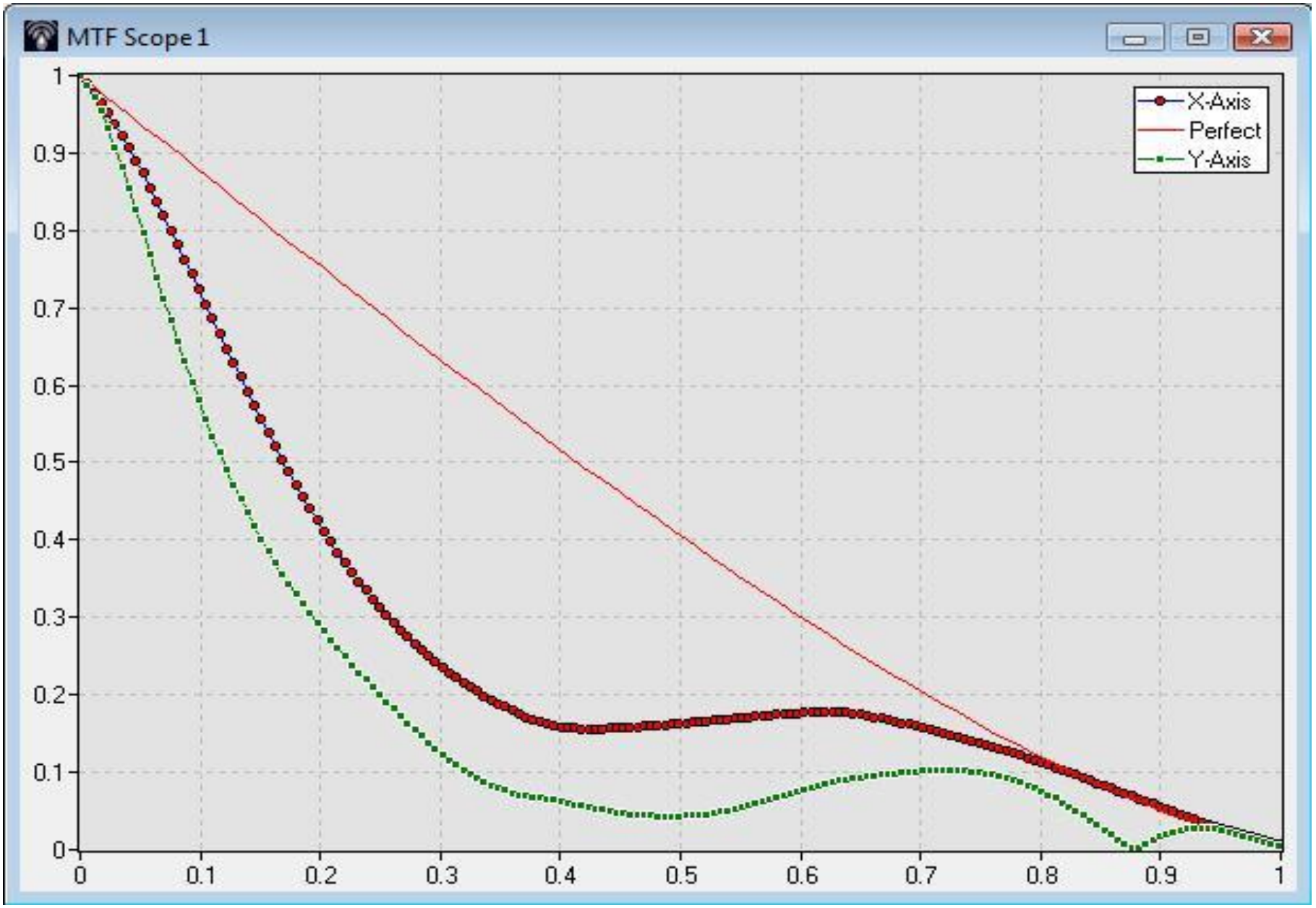
A “Perfect” SCT:



An Uncollimated SCT

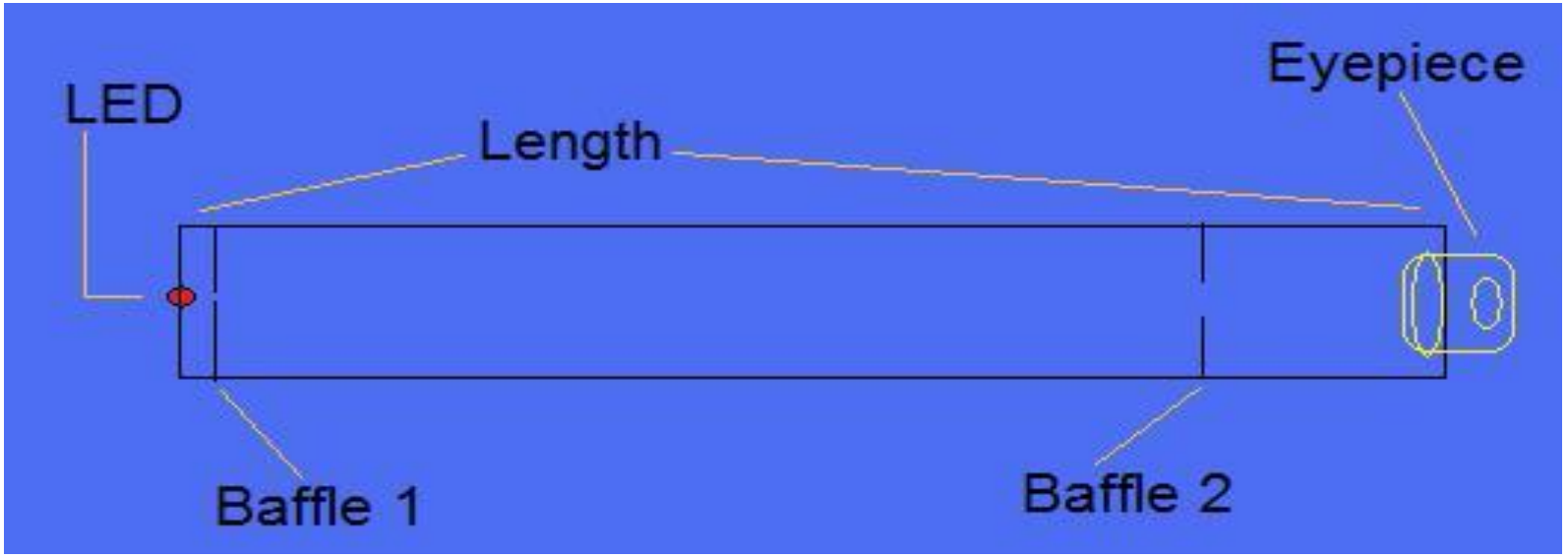


Uncollimated SCT



Collimate on a star

- Use an artificial star!
- I used a #80 drill through thin aluminum for the first baffle.
- Apparent size = baffle1diameter % (length%eyepiece_fl)

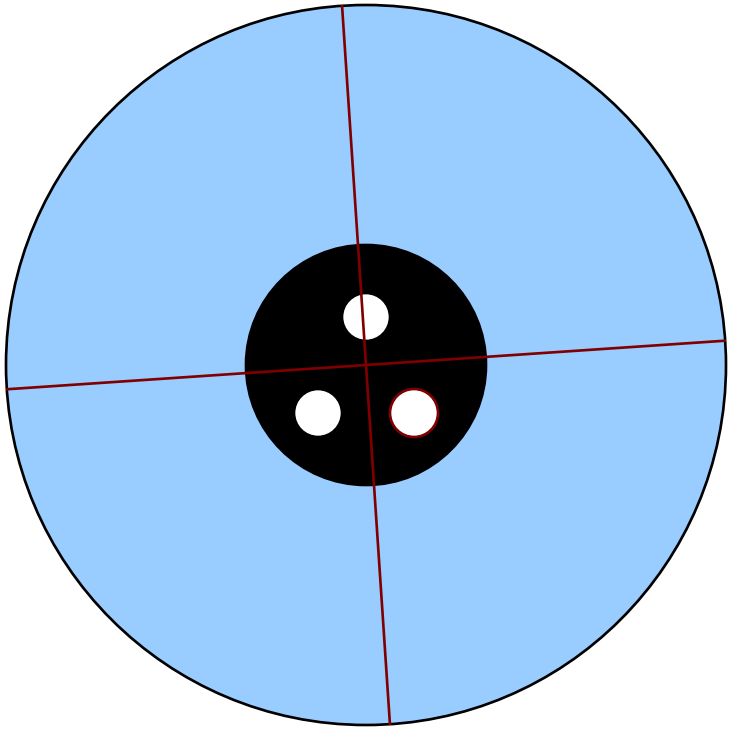


How to Collimate Quickly

- 2 stages of collimation:
  - 1. Centering the secondary shadow
  - 2. Centering the Airy disk
- Both stages use the EXACT same procedure
- The final stages will be turning the screws such a small amount that you can barely tell your taking action

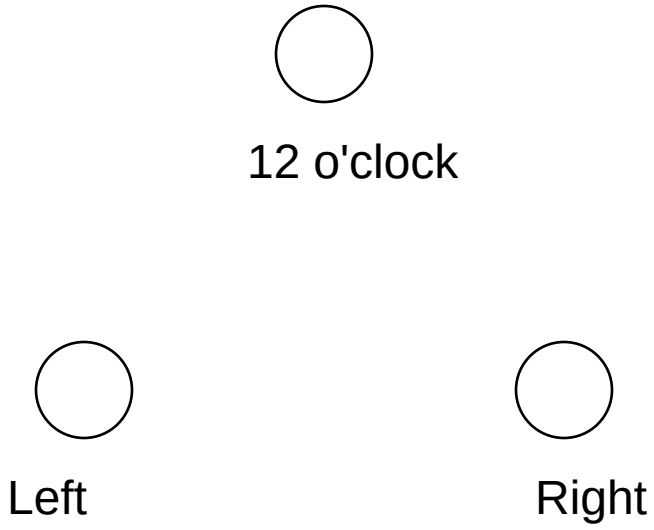
How to Collimate Quickly

- Divide the 3 screws into 2 halves



How to Collimate Quickly

- Assign each screw a name:
  - The one closest to the top is the “12 o'clock” screw
  - The next two are the right and left screws
  - Right and left should be from the rear of the scope

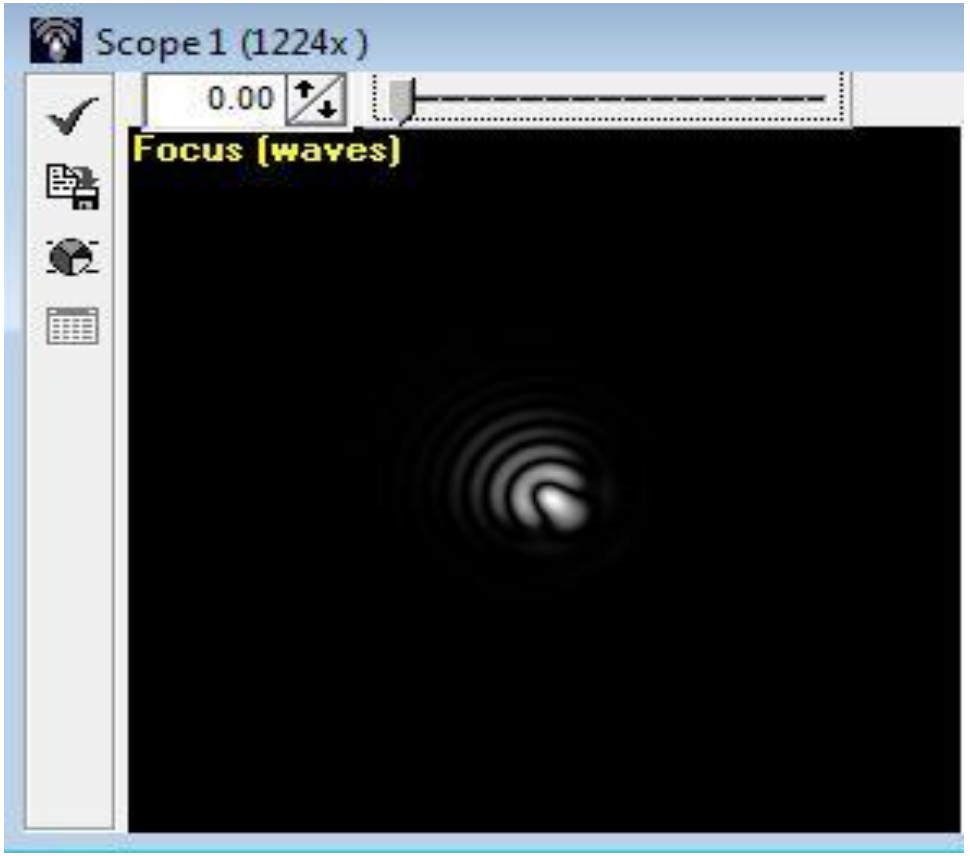


How to Collimate Quickly

- Step one:
  - Rotate diagonal to match the 12 o'clock screw
- Step two:
  - Center your target in the 'scope.
  - Must do this EACH AND EVERY time you adjust a screw
- Step three:
  - Determine which direction the pattern is off in the horizontal plane. Don't worry about vertical yet.

How to Collimate Quickly

- This star is skewed to the left.



How to Collimate Quickly

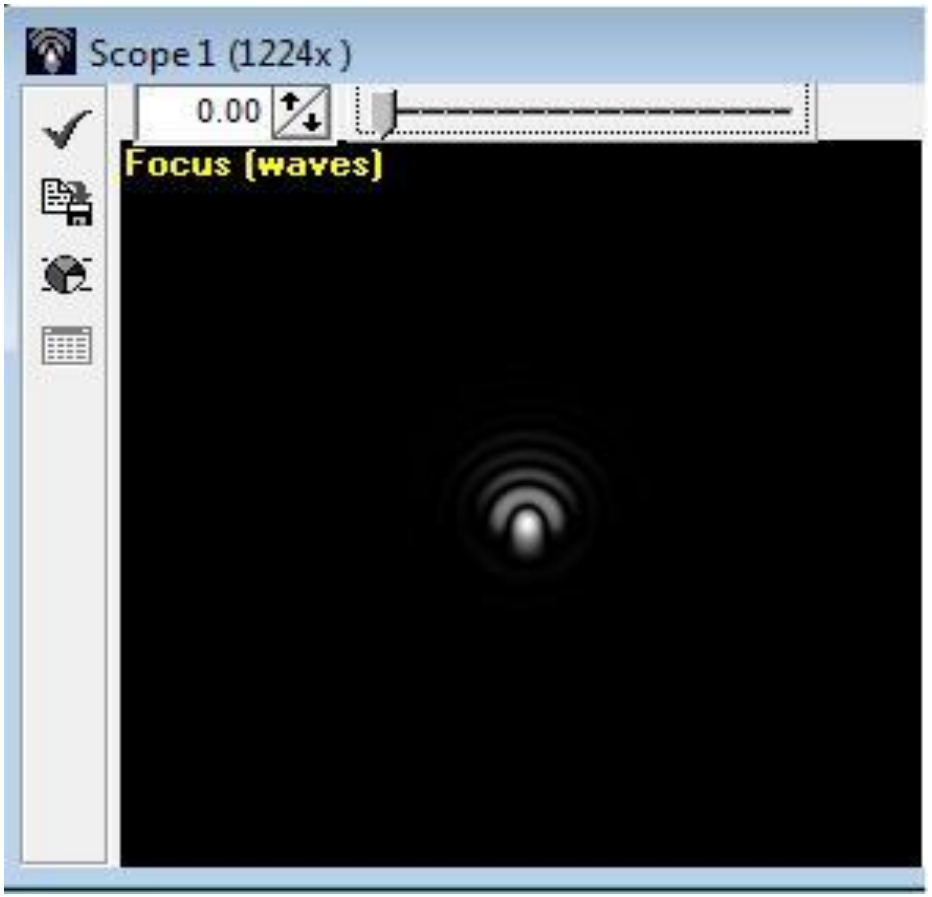
- If performing a rough collimation, the shadow of the secondary would be at about the 10:30 position in the previous example.
- So now looking only at the horizontal error we want to center the pattern horizontally.
- ONLY work with the right/left screws in the first step. Don't touch the 12 o'clock screw
- To adjust for the above error tighten the screw opposite the error to “pull” it back into the correct place.

How to Collimate Quickly

- You may need to loosen the opposite screw while making the adjustments. Only loosen when you MUST, tight screws are good and you are not likely to warp the secondary.
- DON'T TOUCH THE 12 O'CLOCK SCREW!
- Remember to keep the star centered while adjusting.

How to Collimate Quickly

- After L/R adjustment:

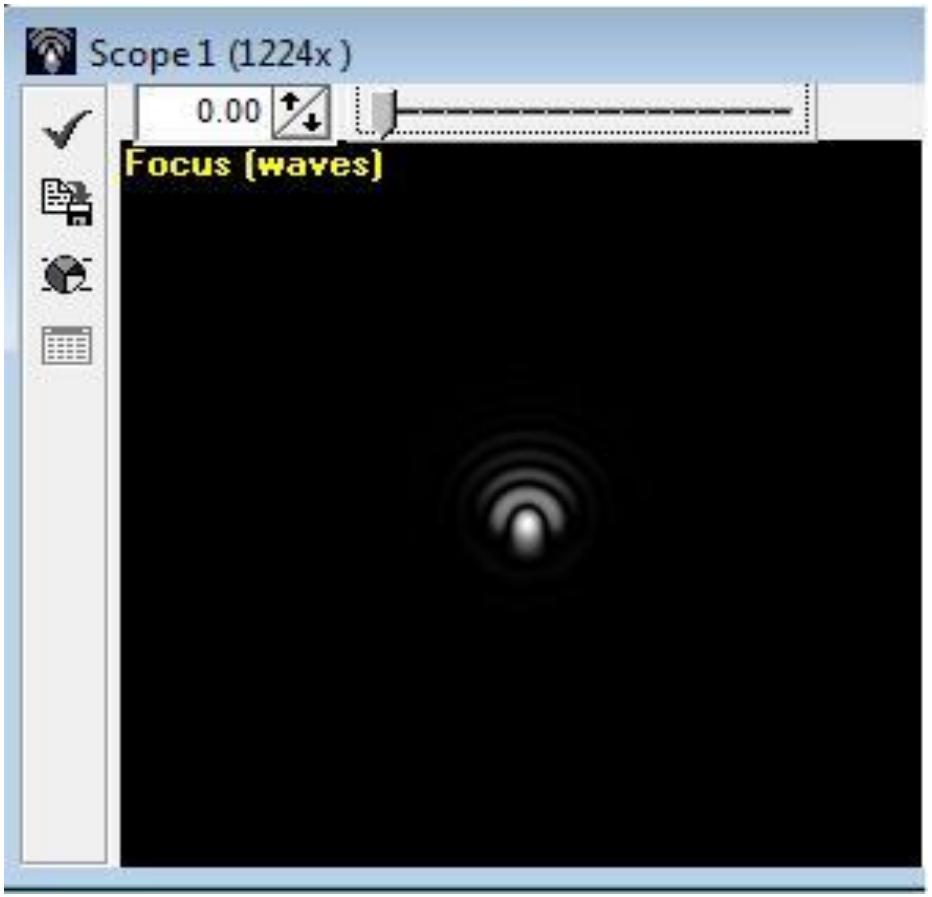


How to Collimate Quickly

- Now that it is correct horizontally, adjust it vertically
- Treat the L/R screws like one screw
- Action is reversed compared to the L/R adjustment.
  - Tightening a screw will push the pattern away from the screw.

How to Collimate Quickly

- Which way do we go?



How to Collimate Quickly

- In this example the pattern is skewed high.
- So we would tighten the 12 o'clock screw to push the pattern down, if needed loosen the R/L screws
- If the pattern was skewed low, you would tighten the R/L screws, and possibly loosen the 12 o'clock screw.

How to Collimate Quickly

- Overview
  - Assign screw “names”
  - Start with secondary shadow
  - Adjust horizontally
  - Adjust vertically
  - Move to diffraction rings
  - Repeat
  - Remember to always defocus in the same direction

Final Result: