Rotary Centering Scan

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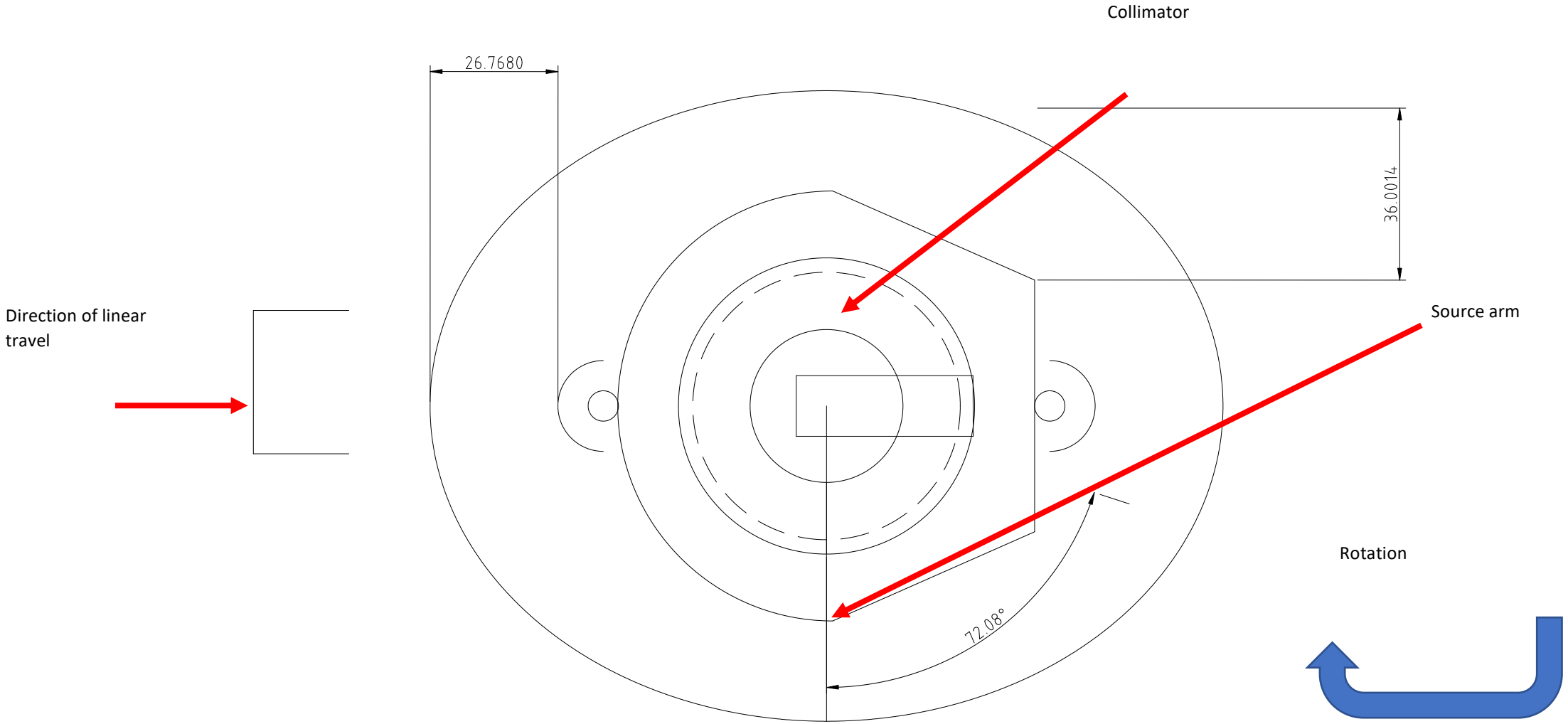
Overview

- Making a plan for rotary centering scans to help find the uncertainty in rotary angle position

72 Degree rotation



Taken from ./topview.pptx

Rotary motor at -72.08 deg

Determining the angle, Θ, that needs to be traversed for rotary centering scans

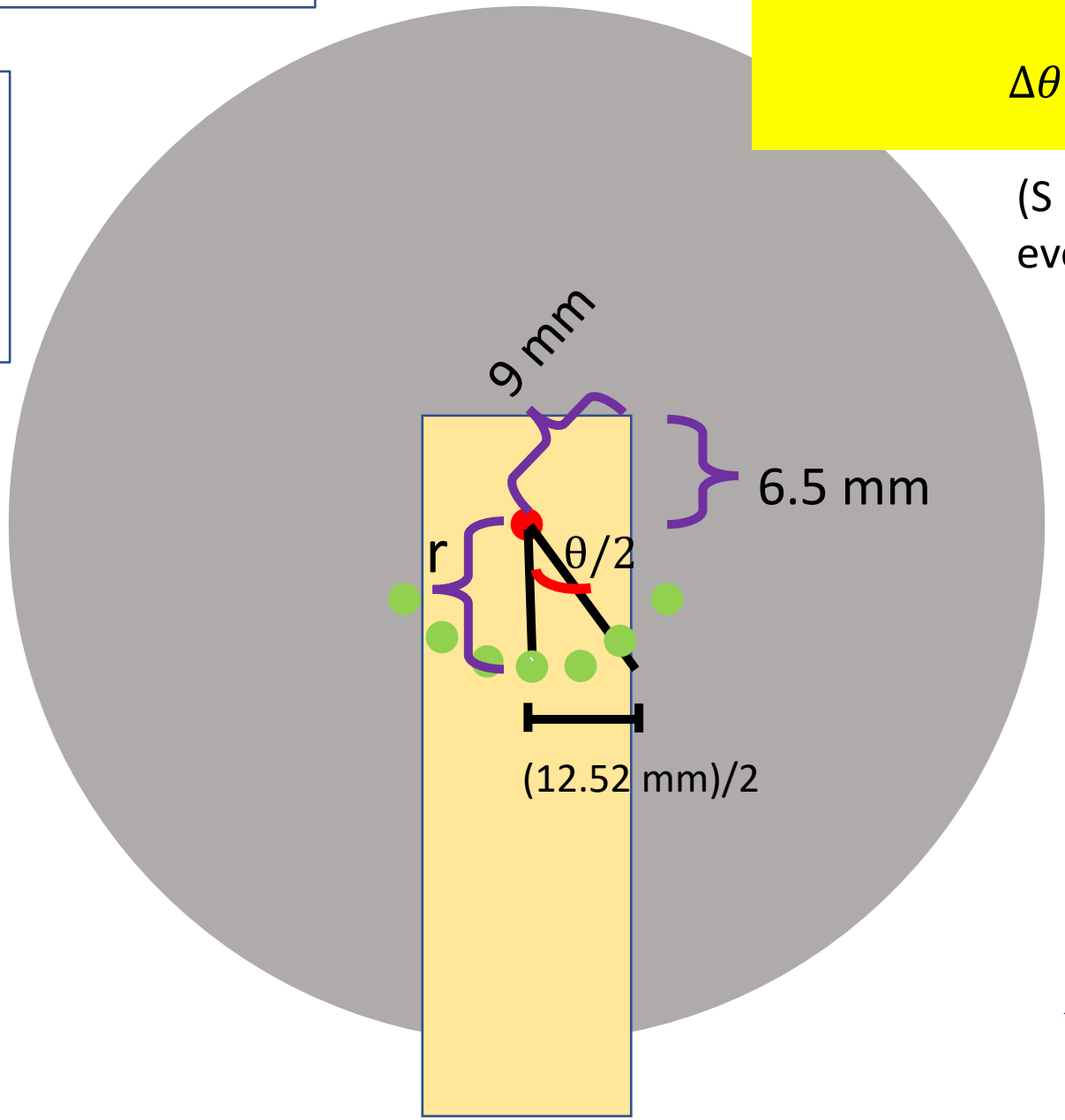
$$\Theta = 2 * \tan^{-1} (12.52/2)[mm] / r\,[mm]$$

$$\Delta\theta = \frac{\Delta S}{r} = \frac{2\,[mm]}{r[mm]}$$

(S = 2 mm if we want a spot every 2 mm)

For r = 12 mm:
$\Theta = 55°$
$\Delta\theta = 10°$

Linear travel



● = beam spot position

Rotation

Proposal

- “center” point for this scan is rotary = -72.08 deg
- Upper limit: 72.08 + theta/2 + 2*delta_theta = **119.6 -> 120 deg**
- Lower limit: 72.08 – theta/2 – 2*delta = 24.5 deg -> **24 deg**
- Try to get scan every ~2 mm arc length -> ~ **d_theta = 10 deg**
- **Final proposal: -24 deg to -124 deg in 10 deg increments**
  - **11 scan positions**
  - **I estimate about 8 hours of lab time with 30 min run + 15 min in between to move motors**

Other notes

- Spot should start overlapping with front-end at rotary = -44.5 deg and overlap until rotary = -100 deg