New way using trig:

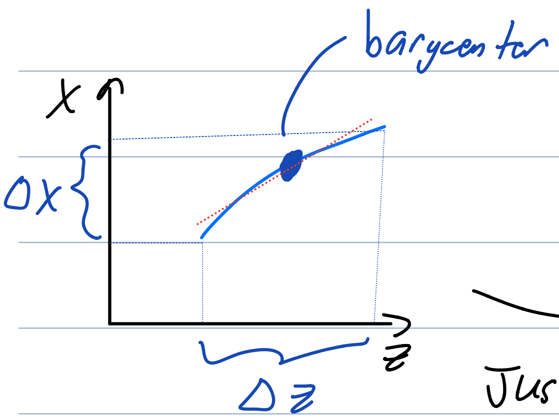
We start with linear fits of the XZ & YZ projections:

$$z = Ax + B$$

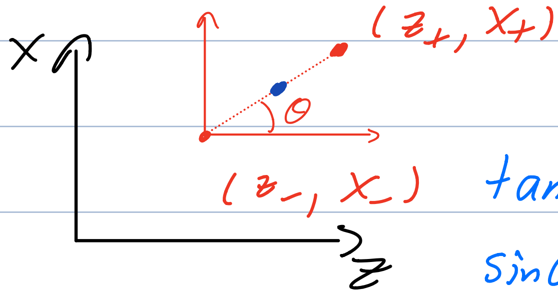
$$y = Cz + D$$

We want to calculate the 2 points at the end of the linear fits w/ approx. linear segment length.

$$\ell_{xz} = \sqrt{\Delta x^2 + \Delta z^2}$$



Just focus on linear fit:



$$\tan\theta = \frac{\Delta x}{\Delta z}$$

$$\sin\theta = \frac{x_+ - x_{avg}}{\ell_{xz}/2}$$

$$x_+ = x_{avg} + \frac{\ell_{xz}}{2} \cdot \sin\left(\tan^{-1}\left(\frac{\Delta x}{\Delta z}\right)\right)$$

$$x_- = x_{avg} - \frac{\ell_{xz}}{2} \sin\left(\tan^{-1}\left(\frac{\Delta x}{\Delta z}\right)\right)$$

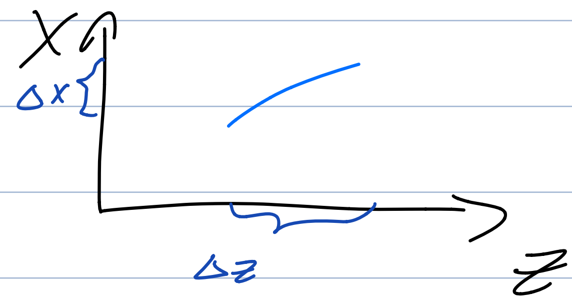
$$z_+ = A \cdot x_+ + B$$

$$z_- = A \cdot x_- + B$$

$$y_+ = C \cdot z_+ + D$$

$$y_- = C \cdot z_- + D$$

Old way using algebra:



Linear fit: $z = Ax + B$

Approximate length in this projection:

$$l_{xz} = \sqrt{\Delta x^2 + \Delta z^2}$$

$$z - z_{bc} = A(x - x_{bc})$$

What 2 points are $l_{xz}/2$ away?

$$\sqrt{(z - z_{bc})^2 + (x - x_{bc})^2} = l_{xz}$$

$$z - z_{bc} = A(x - x_{bc})$$

Solve system of equations

$$x_\pm = \frac{2A(z - B) + 2x_{bc} \pm \sqrt{A^2(l_{xz}^2 - 4x_{bc}^2) - 8ABx_{bc} + 8Ax_{bc}z_{bc} - 4B^2 + 8Bz_{bc} + l^2 - 4z_{bc}^2}}{2(A^2+1)}$$