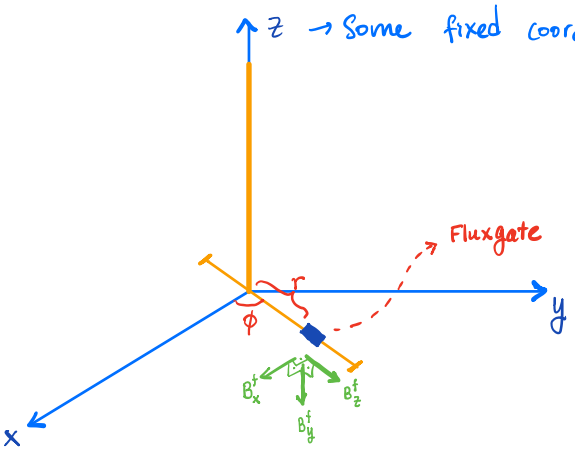

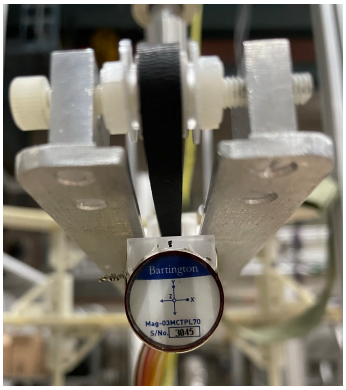

B_i^f = measurements in fluxgate coordinate system

Therefore

$$B_x = B_z^f \cos\phi + B_x^f \sin\phi$$
$$B_y = B_z^f \sin\phi - B_x^f \cos\phi$$
$$B_z = -B_y^f$$

and

$$x = r\cos\phi$$
$$y = r\sin\phi$$
$$z = z$$

where $r = \frac{22.7}{30000}(T - T_0)$ [cm] , $\phi = \frac{\pi}{8000}(R - R_0)$, $z = \frac{38.61}{50000}(V - V_0)$ [cm]

- T: trolley; T_0: trolley value that centers the probe
- R: rotate; R_0: rotate value that aligns the probe along the x direction
- V: vertical; V_0: vertical value for $z=0$

Note/ I assumed that

- the vertical rod and the z-axis are coincident.
- The trolley rail is always parallel to the xy plane