1 READ ME: About Delta Y equation

To determine the particle deflection due to B-field, I followed the equation A14 in Khoo et al. 2023 and expanded the equation without assuming that Δy is equal to zero. Here I assume that v_x is constant and $v_{y,0} \sim 0$.

$$\Delta y = \frac{q}{m} B_{z,1}(v_x \frac{t_1^2}{2} + L_1 t_2 + L1 t_3) + \frac{q}{m} B_{z,2}(v_x \frac{t_2^2}{2} - L_2 t_3) + (v_x \frac{t_1^2}{2} + L_1 t_2 + L_1 t_3) + \frac{q}{m} B_{z,3}(v_x \frac{t_3^2}{2})$$

2 Matlab Code

The matlab code has two ways to compute the deflection of particles. a) Simple trigonometry and only compute the deflection at the magnet/helmholtz coil region. b) a more comprehensive way of computing the deflection as shown in Section 1