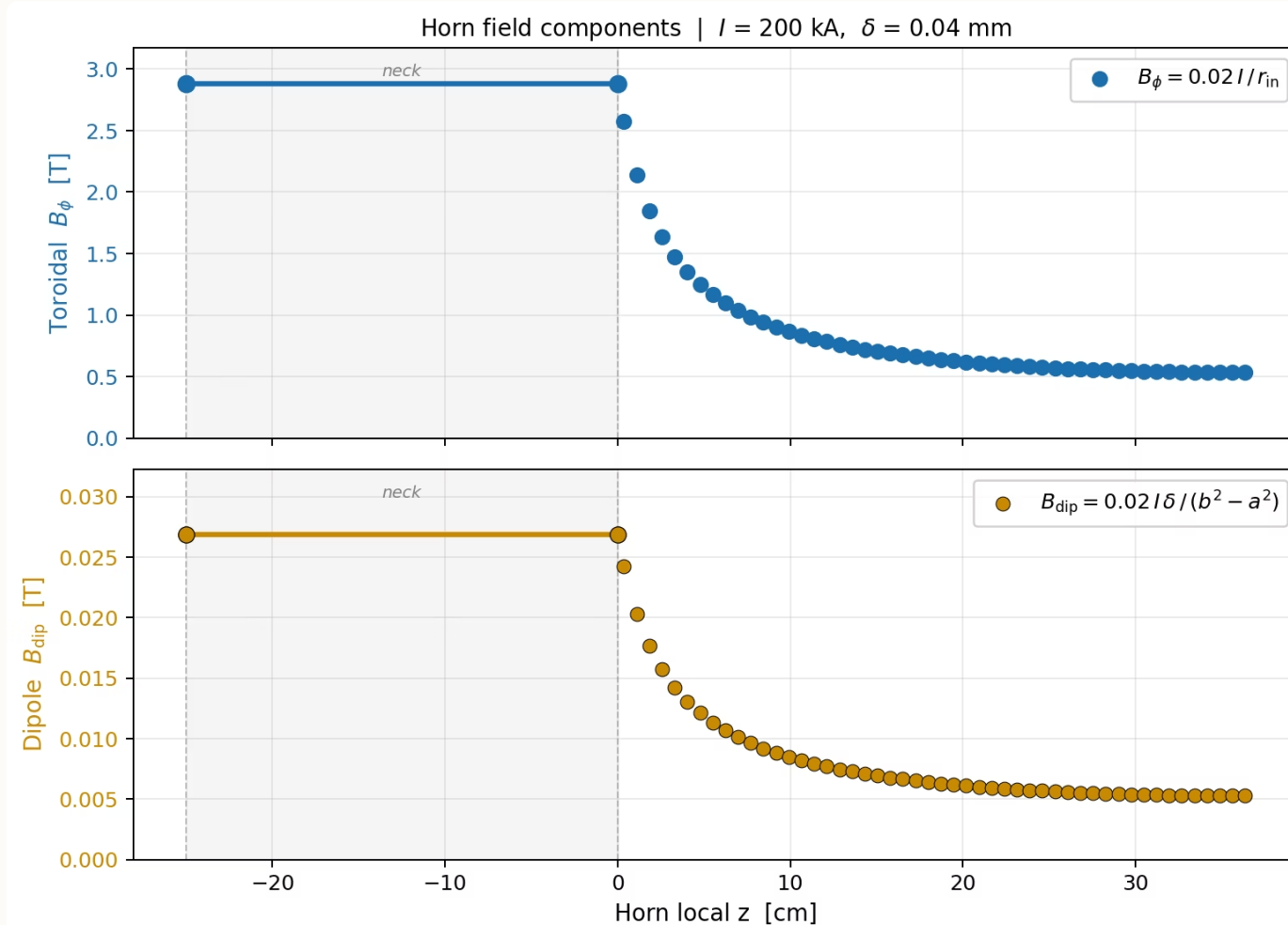


Bug in the Field definition

$$B_{dipole} = \frac{\mu_0 I}{2\pi} \cdot \frac{\delta}{b^2 - a^2}$$

1. the $b - a$ term in this formula refers to the thickness of each conductor in the horn body
2. but in my optimizer code I took it as the gap between the inner and the outer conductors. where $\delta \leq 2\%$ of $b - a$
3. In this situation, the formula breaks down since we considered uniform current density along the conductor
4. Causing unusually high dipole field and thus weird pion counts.

Offset Induced Dipole



To bend a 0.3 GeV/c pion by $\theta = 3^\circ$ over a distance of 40cm:

$$\theta = \frac{0.3BL}{p}$$

$$B_{dipole} = 0.131T$$

1. $\delta \leq 2\%$ of *shell thickness*, shell thickness = 2mm
2. Not a meaningful way to get the particles through the AP0 window, and just tilting the horn is not it as well.