

Trim Magnets as a Fall-back for Kickers in the Sextant Test
Waldo MacKay

The injection kickers need to provide up to 1.9 mr of vertical bend at injection for a beam whose rigidity is $p/q = 100\text{T} \cdot \text{m}$. Given the possibility that the four kicker modules are not ready in time for the sextant test, we should be able to achieve the required amount of vertical bend from the vertical corrector **yo5-tv9** with an additional small trim from the ATR spares.

According to the RHIC Design Manual a single arc corrector powered to $I = 52.2\text{A}$ should give a field $B = 0.596\text{T}$ with an effective length $L_{\text{eff}} = 0.508\text{m}$. The power supplies for the dipole correctors however are limited to 25A, so that the maximum field $B \simeq 0.285\text{T}$. The maximum vertical bend from this trim should be

$$\theta = \frac{q}{p} \int B dl = 1.45\text{mr}.$$

A typical ATR 60cm-long trim with a 3.75" gap powered at $I = 13\text{A}$ has a strength of

$$\int B dl = 0.05\text{T} \cdot \text{m},$$

corresponding to an angle of $\theta = 0.50\text{mr}$. This combination of trim magnets with $\theta_{\text{tot}} = 1.95\text{mr}$ would be sufficient in the event that none of the four kicker modules is ready by the sextant test.