

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

W. MacKay

March 1996

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No. DE-AC02-76CH00016 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

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.