BNL-101661-2014-TECH
RHIC/AP/5;BNL-101661-2013-IR

Effects and Correction of Sexupoles in the Dipoles

G. Parzen

August 1984

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy
USDOE Office of Science (SC)

DISCLAIMER

Effects and Correction of Sextupoles in the Dipoles

G. Parzen
BNL, August 16, 1984

b_2 in dipoles Correction

G. Parzen

	Magnetization b_2	Saturation b_2
$b_2/10^{-4}$	1.6 (10)	3.2 (20), ( ) are b_2' units
Chromaticity Generated	48, -48	96, -96
$\Delta b_{2,H}/b_{2,H}$	-.5	-1
$\Delta b_{2,V}/b_{2,V}$	.6	-1.2

Natural Chromaticity, -74, -65

b_2 for Natural Chromaticity, 30, -60 $\times 10^{-4}$ (200, -400) $\ell = 1$ m

b_2 Correction Coil Capacity, 196×10^{-4} (1200)

Effects of b_2 in dipoles are appreciable, but may be correctable using lumped correction coil b_2.

Stability.

Systematic Stop band at $\nu = 34 = \frac{102}{3}$

$\Delta\nu = .03$ due to natural chromaticity correction

Operating $\nu = 34.4$ is close to this stop band.

Proposed Tracking Study

b_n present, b_2 in dipoles plus b_2 in correction magnet

Study 1) stability limits

2) ν dependence on betatron amplitude, $\nu(A)$

3) ν dependence on $\Delta p/p$, $\nu(p)$

4) ν-values, 34.6 and 34.9

$$\gamma_x = \frac{1}{4\pi} \cdot \frac{NL}{BP} (2) \beta_x \chi_p \frac{\Delta p}{p} B_s$$

$$= \frac{1}{4\pi} \frac{(144)(10.7)}{840} 2(26.4)(1.27)(.01)$$