BOOSTER DOGLEG MAGNETS

Data From Magnet Measurement
4/30/97

$Bl_{mea} := 414.506 \cdot 10^{-6}$ TM/A

What current is required to make a step of 26 mm?

Use $y := 26$ mm

at 400Mev $p_{0.4} := 0.954$ Using $\theta := \frac{0.2998 \cdot Bl_{mea} \cdot I}{p_{0.4}}$

and the design bend center $Spacing := 17.6$ inchs,
solve for the required current.

$$I := 3.336 \cdot \operatorname{atan}\left(3.937 \cdot 10^{-2} \cdot \frac{y}{Spacing}\right) \cdot \frac{p_{0.4}}{Bl_{mea}}$$

$I = 446.047$ amps

What is the effective length?????

Some magnet parameters are:

$g := 2.5$ Gap in inchs

$N := 84$ Number of turns

Note:: When working in gauss-inchs $\mu_0 := 0.499$

$$B := \frac{\mu_0 \cdot N \cdot I}{g} \cdot 10^{-4}$$

$B = 0.748$ Kgauss

$Bl_{mea} := 414.506 \cdot 10^{-6}$

$$l_{eff} := 39.37 \cdot Bl_{mea} \cdot \frac{I}{B} \cdot 2.54$$

$l_{eff} = 24.722$ cm