3MHz Kicker for Head-on-Collision

May have some errors.

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Time Structure of Beam

Outgoing bunch at the center

\[ B_\rho = \sim 1 \text{ T.km @ 250GeV} \]
\[ \rho = L(2m)/\theta = 1\text{km} \]
\[ B = 1\text{T} \]
Sketch of a Kicker

DC+3MHz (+9MHz)

L=2m

2cm x 6cm x 2m = 0.0024m³
Stored Energy W ~ 1200[J] @1T

Variant
Double C-type
Better shielding
Step at center?
Magnetic Alloy (Finemet)

Power Supply Limit

Q < 1 for non-cut core
Q ~ 10 for cut core @ a few mm gap
Waveform of Kicker

\[ \Delta B/B_0 \sim 1 - \cos \left( \frac{2\pi}{100} \right) < 0.2\% \]

9MHz component may be added if needed.
Comments

• MA is used for RF accelerating cavity to generate high voltage.
  → Not for generation of B.

• Required RF power should be estimated.

• Have to be longer for less radiation.

• Need R&D