

Beamline Power Supply Ripple and Regulation Specifications

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The specifications for ripple, regulation, and reproductability of beamline power supplies have been determined for each of the bend and quadrupole supplies in the P150 and A150 beamlines. These three quantities all relate to th same criteria, that is the error in the absolute field during beam time. This specification is most important in the beamlines that will be be associated with Collider operation. The question of slow spill and pbar targeting will be addressed at another time, since most supplies exist are presently in use. The 8 Gev line will also be addressed in a future note.

It is explicitly assumed that any closed orbit errors due to installation misalignments have been removed either by beamline dipole correctors or re-surveying.

Each quad and bend power supply was individually assigned a systematic field error. An appropriate dilution factor (as defined by Syphers> for the mismatch was calculated in each plane.

The criteria used for determining the allowable field error was that the resultant emittance dilution should be unmeasurable. For this I chose a maximum allowable emittance dilution of less than 1/4 pi-mm-mr.

In the case of the quad gradient errors the resultant perturbed lattice functions at the TEV-60 match point or at the downstream end of the injection lambertsons (for vertical dispersion match) were compared with the nominal values. In all cases, the dilution easily meets the criteria with the assigned errors.

Quad Circuits	Magnets	Error
QC1:	Q1	0.3%
QC2:	Q2	0.3%
QC3:	Q3-Q9	0.3%
QC4:	Q10	0.3%
QC5:	Q11	0.3%
QC6:	Q12A, B	0.3%
QC7:	Q13A, B	0.3%
QC8:	Q14	0.3%

In the case of the bend field errors the horizontal closed orbit position and angle at the F17 injection kicker and the vertical position and angle at the downstream end of the injection lambertsons were measured. In each case the dilution criteria is met with the assigned error. The two most critical supplies are B3, for the major horizontal and vertical bends, and B6, for the injection lambertsons.

Bend Circuit	Magnets	Error
BC1	EXT_LAM	0.03%
BC2	CMG+VB1 (4 cmag)	0.03%
BC3	B3A-B10B (14B2)	0.01%
BC4	B3B	0.03%
BC4	INJ_CMG (1 cmag)	0.03%
BC6	INJ_LAM	0.01%



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