

BNL-104811-2014-TECH

AGS/AD/Tech Note No. 395;BNL-104811-2014-IR

A 3/2 LAMBDA BUMP TO CORRECT AGS ORBIT DISTORTION AT THE K17 GAMMA-TR QUAD

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May 1994

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U.S. Department of Energy

USDOE Office of Science (SC)

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> Accelerator Division Technical Note

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May 12, 1994

A 3/2 LAMBDA BUMP TO CORRECT AGS ORBIT DISTORTION AT THE K17 GAMMA-TR QUAD

A set of eight magnets were chosen to produce a 3/2-lambda bump with maximum orbit movement of 10.3mm to the inside at the K17 straght section. (A High-Field Horizontal Tune Quad and one of the six Gamma-Transition Quads are located in this straight section.) The residual distortion outside the bump is constrained to approximately 0.3mm.

The particular magnets were chosen to give maximum movement at the Beta-maximum in the "17" straight section and to have an average phase advance between alternate pairs of 1.0*pi. Modelling was done with MAD and the magnitudes of magnet movements adjusted to reduce residual distortions. The model AGS was operated at tunes:

$$Q-h = 8.830$$

 $Q-v = 8.850$

The resulting moves required are:

DX = -1.4 mmat J16 DX = 1.1 mmat J17 DX = -1.2 mmat K10 DX = +1.6 mmat K11 DX = +1.4 mmat L3 DX = +1.4 mmat L4 DX = 1.1 mmat L17 DX = 1.1 mmat L18

Figure 1 gives a plot of the resulting orbit-distortion (in mm) around the ring.

Figure 2 gives the dispersions (in m). Note the presence of a visible 3rd harmonic in the dispersion function.

The Courant-Snyder parameters Beta and Alpha do not exhibit this (3rd harmonic) behavior.







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