BNL-103910-2014-TECH

AGS.SN30;BNL-103910-2014-IR

Horizontal Emittance at High Intensity, try I10 Extract

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USDOE Office of Science (SC)

DISCLAIMER

Blumberg

NO. 30 FEB COMMISSIONING STUDIES FRIDAY, MAY 25, 1973

Bennett, Blumberg, Glasmann, Guthy, Keane, Levine

Scheduled: 0001-0800 Actual: 0500-0800

(Note: 5Hz studies 0-0800 were cancelled due to Linac P.S. failure)

Objectives: (1) Measure horizontal emittance at high AGS intensity.
(2) Demonstrate capability for extraction out I10.

Results: (1) With AGS at 9×10^{12} ppp were inserted magnets. H10 magnet is an injection aperture with downstream end at 2.3" from B.C. axis. In operating position of 2.0" we decrease (early) CBM to 8×10^{12}. On flattop we had 7×10^{12} remaining. We had difficulties — first with RF turn-off which caused AGS beam to fluctuate, next with FEB power supplies. Drift in timing the firing of the 4 capacitor banks of C15 kicker prevented us from obtaining the 3 μs 8000 A waveform which allowed full extraction on 5/22. There was qualitative evidence that at least one bunch of the many that appear on external current transformer per spill was fully extracted, giving us confidence that with proper kicker current we can fully extract at high intensity. It did not seem worthwhile to try emittance measurements with such erratic spill.

(2) There was no time to change H10 magnet polarity and try getting shaved beam to I10.

AGS Physics Group Talk Fri. June 15, 1973

FEB Studies results and plans.

June 15 p.9 E10 + H10 bump orbits. 40mm and 37mm respect.

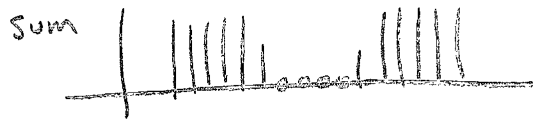
June 29 p.16 C15, E15 Kickers.

Aug. 8 p.21 Note vertical oscillation induced by kickers.

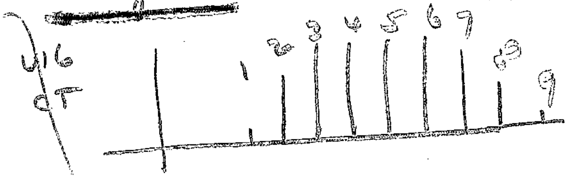
April 10 ν_V measurements. at E3 ≈ 0 $\nu_V \approx 8.65$. No $\Delta\nu_V$ from bumps, as expected.

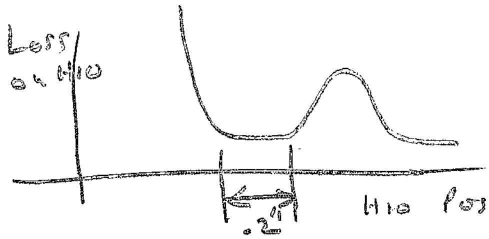
Apr 26

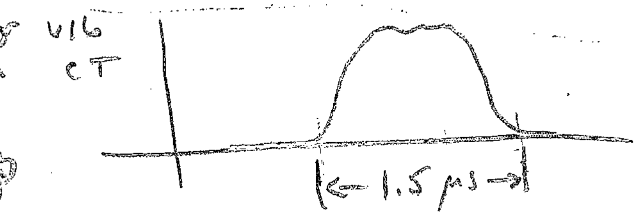
May 1. with CBM = 4.7 10^{12}, injection aperture at E10 is 1.1" We extracted but didn't see spot on U16 flag.



May 8 1.7 10^{12} ppp



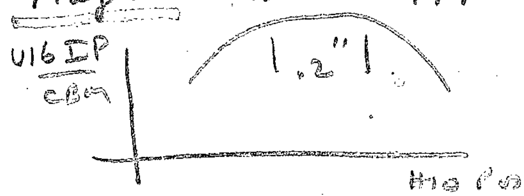


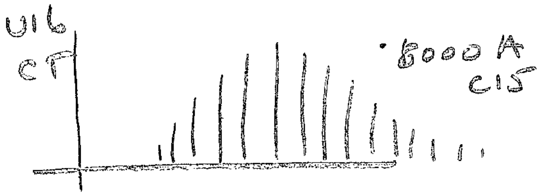


post FEB loss observed.

Note ever "persistent" loss 3 msec after FEB

May 10 1.6 10^{12} ppp





May 14

May 16 vertical profiles. 3.5 10^{12} bunched. Still see post-FEB loss!

46 gp

May 17 debunched FEB. 5 10^{12} bunched.

May 22. FEB + SEB compatibility. Full extraction of 4×10^{12} bunched; using large C15 capacitor banks.

MAY 25 saw that H10 is an aperture, starting with downstream end at 2.3" wrt BC axis