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Low Intensity (~107 ppp) in -beam. Calibrate vc Counter

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AGS Studies Note

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1) Participants. Balsamo, Blumberg, Gill, Glenn, Lee, Soukas, Witkover

2) Purpose. Obtain calibration at $\sim 5 \times 10^{11}$ ppp for lexan Cerenkov counters ¼" thick located in air space adjacent to .004" Aℓ window downstream of U165 box vs U165 current transformer. Then obtain a spill of $\sim 10^7$ protons/100 μs in U-channel for Baltay-Kalbfleisch studies of narrow band neutrino horn using integrated Cerenkov counter signal.

3) Scheduled time. 1000-1330. Actual time. 1130-1600 (with HEP on).

4) Results. (A) First, orbits were taken for the E10 and H10 backleg bumps at 560 ms, just before flat top. At 1/2 of normal FEB excitation, they gave deflection of 2.5 and 2.0 cm respectively--quite reasonable results. Also orbit of L5 RBD taken at t = 522 ms, giving +.5 cm deflection at E10 for 1 kV on RBD supply--also quite reasonable.

(B) H10 magnet moved into operating position ≈ 2.5 in. from H10 ℄. Late CBM decreased from $\sim 1 \times 10^{13}$ ppp to $\sim 6 \times 10^{12}$ ppp. Then E10 moved into operating position ≈ 2 in. from E10 ℄. CBM decreased to $\sim 5 \times 10^{12}$ ppp. Attempt to put an injection orbit bump around E10 and H10 increased CBM to $\sim 7\ 10^{12}$ ppp.

(C) FEB power supply trigger changed from after invert to t = 1265 ms, about 100 ms before end of the 700 ms SEB spill and end of flat top. No signal was observed on U15 current transformer. Faint beam spot $\sim$ ¼" H × ½" V observed on U165 radelin flag. Cerenkov counters saturated on most sensitive scale and 1100 $\overset{V}{-}$ on 6199 PM's. Signal ok on less sensitive scale, 700 $\overset{V}{-}$ on photo tubes. No signal seen on U167 current transformer (U165 CT inoperative). Signal seen on U165 scintillation counter loss monitor but could not be observed when counter signal patched up to Main Control Room. Internal AGS beam current transformer showed $\sim$ 2% loss of internal beam at FEB ejection time.

(D) From theoretical estimate of Cerenkov photons/proton, light collection efficiency, and photo cathode efficiency and photo tube gain, we extracted $\sim 10^9$ protons in $\sim$ 100 μs. Since there was no external beam signal in Main Control, it was not possible to optimize extraction. Flipping G10 target or pulsing L5 RBD gave no indication of increased external beam. Next time C15 beam kicker should be used.

cc: Studies Group
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