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National Laboratory

BNL-103906-2014-TECH

AGS.SN25;BNL-103906-2014-IR

## Optimize H10 Magnet Position, Test Instrumentation

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May 1973

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**U.S. Department of Energy**

USDOE Office of Science (SC)

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Scheduled: 0001-0800 Actual: 0200-0800

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- Objectives:
- (1) Test U16 insulated plate as external beam monitor.
  - (2) Optimize H10 magnet position using U16 plate.
  - (3) Test horizontal and vertical profile arrays.
  - (4) Attempt total beam extraction by increasing capacitance (and thus duration of current pulse) in CIS kicker power supply.

Results:

The most significant result of this study is that we set up the same conditions as May 8<sup>th</sup> run and the extraction was identical. The method appears to be reproducible, stable, and simple, as advertised.

(1). The U16 plate (1010" Al at 45° to beam) gives 3.5 volt integrated signal on  $C = .0033 \mu\text{F}$  capacitor for  $\sim 10^{12}$  ppp.

(2). We moved H10 magnet radially to maximize ratio U16/CIS and find clearance of  $\sim .2$ ", which implies separation between circulating and extracted beam of  $\sim .3$ " at H10. This for E10 septum at maximum kick,  $\sim 1.4$  mrad. Above measurement agrees with the  $\sim 5/16$ " separation seen on H10 flag. It still seems premature to say that H10 septum could be made thicker — separation will be smaller with larger circulating beam intensity than the  $1.5 \times 10^{12}$  ppp we use here.

(3) Both profile arrays work fine. Spot size seemed quite reproducible on pulse-to-pulse basis.

(4) Added  $1 \mu\text{F}$  to the  $.2 \mu\text{F}$  of CIS capacitor bank. At 20 kV on bank, the peak current went from previous 5000 A to 8000 A and pulse duration from 2.4  $\mu\text{sec}$  to  $\sim 6 \mu\text{s}$ . With only CIS on, essentially all circulating beam removed from ring. Externally we see 15 bunches — most partially shaved. A guess would be that we extracted about 80% of A&S in 3  $\mu\text{sec}$  using only one kicker.