



Brookhaven
National Laboratory

BNL-103906-2014-TECH

AGS.SN25;BNL-103906-2014-IR

Optimize H10 Magnet Position, Test Instrumentation

G. W. Bennett

May 1973

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No.AT(30-1)-16 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Scheduled: 0001-0800 Actual: 0200-0800

25

G. Bennett, L. Blumberg, J. Guthy, J. Keane

- 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 8th 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, ~ 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 1.5×10^{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 $\sim 6 \mu\text{sec}$. 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.