BNL-103939-2014-TECH

AGS.SN61;BNL-103939-2014-IR

Beam Tuning to Maximize Accelerated Beam

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April 1974

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USDOE Office of Science (SC)

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NO. 61 Blumberg

Low Field & Capture Studies (4/16/74), Rabe, Gill, Herrera

The machine was "tuned" in order to maximize the accelerated beam.

Conditions

1) Linac ran very well after 0100, giving ~ 70 ma for 140 μsec. Max after multiturn ~ 1.2×10^{13} p/p.
2) Per J. Claus, linac emittances were up by approximately 1.5 times their normal values.
3) Average ring vac ~ 3×10^{-7} Torr.

Results

1) The max beam accelerated was 7.22×10^{12} p/p, with 7.5×10^{12} on the early counter. The machine ran steadily in the 7×10^{12} region.
2) In order to achieve 1) it was necessary to compromise the early beam counter reading and the effective turns rate.
3) At one point, we could get 9.45×10^{12} p/p on the early monitor with about 8 turns. However, horizontal coherence appeared at about 20 ms after injection and the beam was very erratic with maxima of about 6.8×10^{12} p/p. The ν values under the condition were ($\nu_H \simeq 8.84$; $\nu_V \simeq 8.75$).

JGH, 4/19/74