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Beam Stacking to Restore Early CBM to 1.8 1013

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Beam Stacking Studies - (AvS, Claus, Herrera)

Objective

To restore stacked beam intensity to nominally > 1.8 10^{13} ppp.

Results

First part of the study was spent in setting back linac to standard "start-up" program. Tank 9 ran anomously low in amplitude and, after some exploration, an improved momentum spread was obtained by correcting tank 9 phase setting and raising its amplitude setting to near normal value. Subsequent to this, momentum spread and emittance were measured indicating standard optimum values.

Following this the beam was set up for spiralling beam only. A check and minor correction of all relevant parameters resulted in a stacked beam intensity of approximately 1.6 X 10^{13} ppp as indicated by the turns ratio ($\cong$ 9.3 X) and injected current ($I_L \simeq$ 60 mA). (Note: The H15 transformer needs recalibration.)

Because of large rf amplitude signal variations J. Herrera did set-up the rf capture program with delayed bootstrap mode starting time. This improved beam capture to the point of 8 X 10^{12} ppp early CBM, with however, still not more than $\sim$ 6 X 10^{12} late CBM.

At this point it was decided to use the horizontal-vertical combined stacking mode with the objective of leaving the inflector in a "lowered" position if in a very short time 80% of normal operational intensity could be achieved. This did not turn out to be the case, presumably mainly because of the near equalness of present machine tune values. After approximately one hour of exploration of various parameters including change of the vertical "match" while maintaining the horizontal matched emittance, the inflector was returned to its normal position.

It is the intent to try to migrate the injection υ values during the next two weeks to $\upsilon_V \simeq$ 8-2/3 and $\upsilon_H \cong$ 8.8.