Minutes of the SPS Studies Working Group (SSWG)

15^{th} meeting -24^{th} October 2000

Present: G. Arduini, T. Bohl, H. Burkhardt, Yu-Chiu Chao, K. Cornelis (chairman), W. Hofle, L. Jensen, J. Klem, T. Linnecar, L. Peguiron, J.-P. Quesnel, E. Shaposhnikova, R. Tomas, J. Tuckmantel, F. Zimmermann, M.P. Zorzano (secretary)
Excused: R. Cappi

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1 MD planning (G. Arduini)

Proposal for the long MD on the 2nd November at 26 GeV:

- Starting 06:00 am-9:00 am, single bunch for injection line and matching monitors studies (no capture needed).
- 09:00-18:00-04:00: LHC-like beam, first part longitudinal instabilities studies, lifetime in coast at 26 Gev studies, second part transverse effects and electron cloud with different fill patterns (from the PS side it is easy to create a gap of 12 bunches by stopping one of the PS boosters), and bunch spacing (50 ns is the easiest).
- 04:00-06:00 if possible, experiment with the AC dipole method at 26 GeV using the damper kickers operated in an AC dipole mode to validate if this can be used to excite the beam up to 3 sigma (needed for dynamic aperture studies) assuring that the emittance is preserved. The method can also be checked as a function of the excitation frequency and in the presence of nonlinearities. These studies will probably be done on a single LHC batch.

2 SPS alignement (L. Peguiron)

Several plots of the SPS quadrupole alignement have been shown for the SPS ring, for the vertical and radial dimension. The vertical studies are based on measurements of the years 1998, 1999 and 2000. The radial studies are based on measurements of the years 1985-1989,

1998, 1999 and 2000. One can distinguish a large offset (17 mm vertically, 5 mm radially) at the Dog-leg area (LSS1) plus a general modulation.

The reference values are given by the quadrupole positions, and the positions of the dipoles and every other elements are interpolated from the quadrupoles values.

Some of the elements displacements have been chosen volunteerly this way, to have a positive global effect on the orbit. The aim of these studies is to optimize the alignement according to a circular reference orbit, respecting some of the desired missalignements. It is worth mentioning that the circular reference system is no longer valid for LEP, where an ellipsoidal system is used. In the transition from one to the other it is convenient to optimize the alignment to some intermediate value between what is required by the circular and elliptical system.

The alignment will take place in the shut down, using 4 weeks per sextant for the quadrupoles, 3 weeks per sextant for the dipoles, 2 weeks per sextant for the pick-ups and 3 weeks per sextant for the straight sections.

3 MD results: comissioning of H2 digital filter (W. Hofle).

During the MD of 19/10/00 the feedback delay has been adjusted and validated with measurements performed on 48 bunches with 1.2×10^{12} p (low intensity) in an LHC like beam. The damper works in either plane within a few ms, then the beam is unstable again. If the frequency of this instability is within the feedback bandwith this would mean that the delay time is not yet matched. Further analysis of the available data can give more information on this.

4 Beta function for the transfer line (F. Zimmermann)

The beta function for the transfer line has been computed using a modified version of MAD that tracks the Σ matrix (avoiding the problem of emittance transfer between the two planes that appeared in the old version of MAD). These beta functions can be used for matching.

5 AOB

The next scientific secretary will be F. Zimmermann.

6 Next meeting

The next meeting is scheduled for Tuesday 7th November, at 09:15, Room 865-1D17. A reminder will be sent by email in due time and the agenda will be announced on the web page of the working group http://cern.ch/sl-mgt-sps-swg

M.P. Zorzano 25th October 2000