

Status of the machine studies

APC meeting, 10/10/08

1) Study of the BSI of T2/T4/T6 in the SPS North area (E. Métral)

- Studies done with/by Stephane Cettour Cave (OP).
- Reported the last time for T6. We tried and finished this study also for T2 and T4.
- Next step: Discuss with BI people to see if one should change these foils to have more reliable intensity measurements (which are used in SPS page 1 and statistics...), or if one should apply calibration factors (as was also done in the past).

2) Parallel MDs during week 40

- Continuation of the PS transition studies (S. Aumon and W. Baartman). Data still to be analyzed.
- Continuation of the SPS TMCI at injection (B. Salvant). Data still to be analyzed.
- Preparation of the beams which will be used during the Long Injector MD of week 41.

3) Long Injector MD of week 41 (E. Métral)

- Bunch intensity scan with the 50 ns LHC beam in the PSB, PS and SPS. The idea was to check in particular the MKDVs heating/outgassing in the SPS, which seems now to be OK. Furthermore, we succeeded to accelerate the ~ nominal 50 ns beam (with 4 batches) in the SPS and measured transverse emittances at 450 GeV/c of ~ 1.5 micrometers in both planes. This is a very interesting result, as in this case "the long range beam-beam effects for beta of 55 cm are history and we have a lot more options for the squeeze, and far more aperture of course" (dixit W. Herr).
- Bunch intensity scan with the 75 ns LHC beam in the PSB, PS and SPS. The idea was to check in particular the bunch length increase along the batches in the SPS, which seems to have disappeared.
- ~ Nominal 25 ns LHC beam in the SPS to check in particular the ecloud on SPS liner: carbon coating seems much better than (saturated) NEG. However, the PS (ecloud) instability re-appeared, which confirms that we are really at the limit. Furthermore, after some time a fast vacuum valve (usually blocked out during LHC MDs) closed which cut then beam. This really means that there is a limitation there for future LHC high-intensity operation in parallel to FT.
- InCA studies seemed OK.
- Matching monitors' study in the SPS was not successful due to problems linked to the camera.
- Study in the SPS with 2 bunches of different intensities: LHCINDIV (1.15E11 p/b) + LHCPILLOT (5E9 p/b)
=> We could inject the 2 bunches (with the 2 different bunch spacings) and accelerate them up to 450 GeV/c. The measured bunch lengths at 450 GeV/c were ~ 1.2 ns for LHCINDIV and ~ 0.8 ns for the LHCPILLOT, whereas the measured transverse emittances (rms, norm) were smaller than 3 micrometers. This result could give more flexibility for the LHC filling schemes.
- BQK calibration => Finished.