

Plan for 500 GeV Development

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Goals

1. Explore polarization transmission to the 500 GeV CM energy.
2. Inspect the luminosity aspects (with 2 collisions): store lifetime, total intensity limits.

Machine configuration

- Beta* (IP6,IP8): 2m
- No crossing angles
- Standard tune swing at 100Gev:
(.72;.73) -> (0.69, 0.68)
- No rotators

Plan (1)

- Day 1:
 - Ramp development with 6 bunches(3 shifts)
 - Tune/decoupling feedback application
 - Orbit correction below 0.5mm
 - Machine protection at higher energies (several quenches during 205Gev development last year)
- Day 2:
 - Finishing ramp development with 6 bunches (1 shift)
 - 56 bunch development (2 shifts)
 - Ramp improvement to deliver higher intensities
 - Polarization measurements at the store.
 - Store development and collision steering.

Plan (2)

- Day 3-4:
 - Polarization transmission development (2 shifts)
Goal: to maximize injection-to-store polarization transmission.
 - If the polarization loss is obvious:
 - polarization ramp measurement
 - tune/orbit corrections at the position of polarization loss.
 - Polarization profile measurements at injection and store in both planes.
 - Polarization setup at store (1 shift)
Goal: to measure the width of depolarizing resonances at the store
 - Tune scans at store both Qx and Qy around 0.7. One at a time
 - Profile measurements at store in both planes
 - Polarization studies on the ramp (2 shifts)
Goal: to evaluate the tolerances for orbit and betatron tunes on the ramp
 - Polarization ramp measurement
 - Systematic measurement as function of closed orbit distortion at one of three major resonances above 100 GeV
 - Systematic measurement as a function of tunes at the resonances.

Plan (3)

- Day 4-5:
 - Beam-beam limit (1 shift):
 - Goal: to compare beam-beam limits at 100 and 250Gev*
 - Collisions with bunch intensities achieved during 100Gev run (6 bunch ramp) (1 shift)
 - Total intensity limit (1 shift):
 - Goal: to check for possible total intensity limits*
 - 56 (110 bunch) acceleration with high bunch intensities ($>1e11$ p/bunch)
 - Stores (~4h)
 - Goal: to evaluate beam lifetime and polarization lifetime (2 shifts)*
 - Varying the (vertical) tune distance from 0.7 from store to store
 - Can be used by the experiments. (Local polarimeters?)

Run layout

- Ramp and polarization development: 8 shifts
- Dedicated polarization studies: 3 shifts
- Dedicated luminosity studies: 4 shifts
- Contingency shifts: 3 shifts

- Total: 18 shifts or 6 days