

# Conclusions - Action items

ALL

**CDF/D0/AD luminosity meeting  
of December 5, 2007**

# Conclusions - Action Items

- After the shutdown the CDF/D0 luminosity ratio has been ranging between 1.08 -1.10. After introducing alpha bumps though at D0 on Dec. 3, the ratio became 1.068 in store 5780, and it is in the range 1.05 – 1.07 since then with the value of 1.05 in the most recent store, 5795. This is similar to pre-shutdown levels.
- The CDF/D0 initial luminosity ratio did not exhibit any dependence on luminosity after the shutdown. It will be interesting to monitor though closer this behaviour after store 5780.
- Both the CDF and D0 measured luminosities are closer to the “expected” luminosities after the shutdown. These comparisons will be repeated after the newly measured Tevatron lattice gets introduced into SDA.

# Conclusions - Action Items

- Optics measurements performed by the Tevatron group using the “differential orbit” method in proton-only studies in October, 2007 (15% accuracy) indicate that  $\beta^*_x$  is 28.4 at CDF and 28.2 cm at D0 and  $\beta^*_y$  is 29.6 at CDF and 30.8 cm at D0.
- The D0 horizontal waist position has been shifted downstream by 5-10 cm and the vertical one upstream by about 5 cm on December 3. The Tevatron group would like to see that the D0 beam width fits confirm this.

# Conclusions - Action Items

- The Tevatron group observed recently some correlation between losses (C:LOSTP) and the CDF luminosity measurement. CDF plans to update older studies that have shown independence between the luminosity measurement and the losses.
- D0 has replaced during the shutdown all scintillator in the luminosity monitor detector because of radiation damage. HV and threshold scans indicate that the detector is operating on the plateau of the distributions.

# Conclusions - Action Items

- **The D0 forward muon yields show stability of the system within 1% during Run IIb. An end of October run, after the shutdown, was included in this study as well.**
- **CDF traced some instability in the luminosity measurement to bad soldering in the PMT bases and replaced 26 bases during the summer shutdown. The problem is now fixed. The effect on the luminosity measurement is small and they are in the process of quantifying it more accurately.**

# Conclusions – Action items

- CDF will try to provide some physics objects yields a little before and a little after the summer shutdown.
- It would be very useful if both experiments could provide updated physics objects yields as a function of luminosity.

# Conclusions – Action items

- CDF has started using a new method to calculate beam widths which is based on calibration data. This method is similar to (and consistent with) their “offline” method but more accurate and with a much quicker response. It can give results in about a week from data taking. The plan is to develop this method further so that beam widths and fits are being produced automatically and deposited in a web page. Their result for  $b^*_x$  is between 26-27 cm with a fit uncertainty of less than 1 cm and for  $b^*_y$  between 29-30 cm with a fit uncertainty of about 1 cm. These results are consistent with the outcome of CDF’s beam width measurements using z-vertices ( $b^*_x$  and  $b^*_y$  the same) as well as the Tevatron group measurements.

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- D0's beta\* measurements see a significant change after the shutdown, especially for  $b_x^*$ . The values are now clustering around 40 cm for both  $b_x^*$  and  $b_y^*$ . Since stores from 5780 and on were not included in these studies, as a first step, we would like to see if the fits see the beam waist position changes implemented on December 3.
- We also plan to perform a comparison of emittances coming out of the two experiments on the basis of their beam width fits. We are in the process of selecting appropriate stores and times within these stores where such a comparison would be most useful.

# Conclusions – Action items

- We are aiming to have the next joint luminosity meeting sometime in February 2008. We plan to decide in January what would be the best possible time.