



Do we understand the low $p\bar{p}$ production in the AD?



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Background

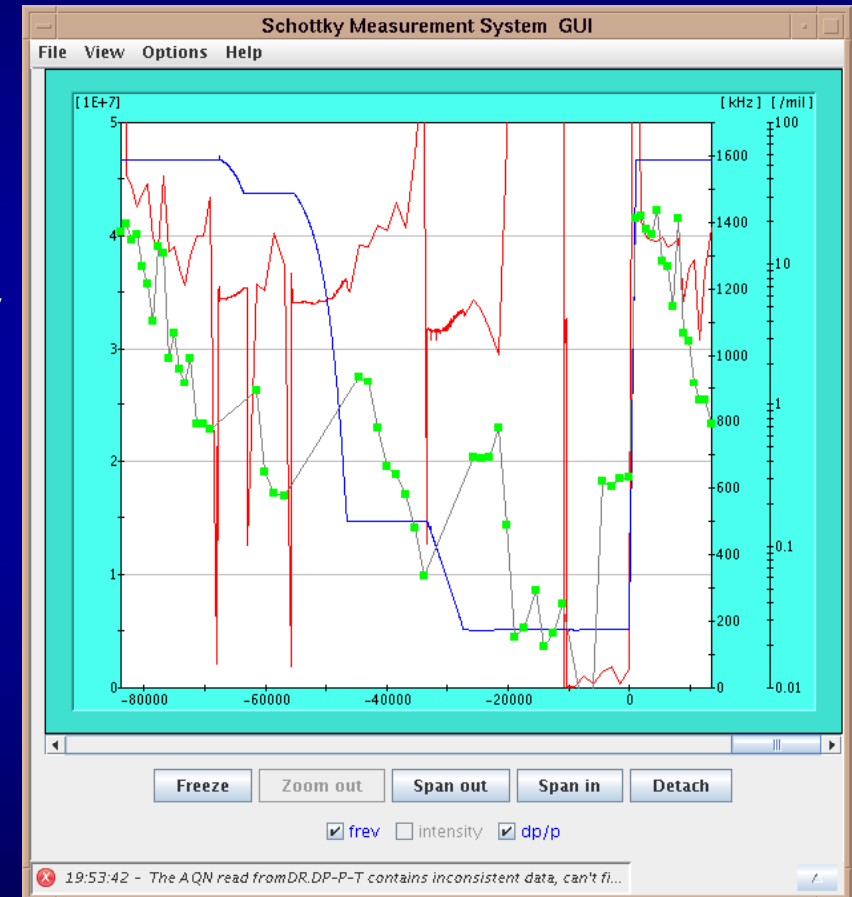
- Injected pbars/cycle *E7 (*)
- Users complain somewhat, but are not willing to give up beamtime...

	2006	2007	2008
At startup	3.5	3.9	2.5
Peak	3.8	4.7	3.8
Typical during run	3.0 - 3.5	3.5 - 4.5	3.0 - 3.5



(*)

- AD intensity measurements don't tell everything
 - Precise measurements only available AFTER Bunch Rotation, stochastic cooling and re-bunching
 - Losses can occur during these processes





What was done in 2008

- Very short startup, but some time recovered during run
- PS beam long. + xverse parameters verified
- PS-AD transfer optics reviewed by S.Gilardoni
- Xmission through inj.line up to target has degraded, tuning more difficult in 2008

Are our transformers reliable?

=> Eh,v of production beam ??

2007 peak:

Name	STAQ Int.	Nb Part.
FTA.TFA9012	On	1478.000
FTA.TFA9053	On	1450.000
DI.TFA6006	On	855.000
DR.TFA5302	On	93.000

- FTA.QFO9052 supply repaired (was 7% down): temporary optics compensation was used. No difference in intensity could be observed.



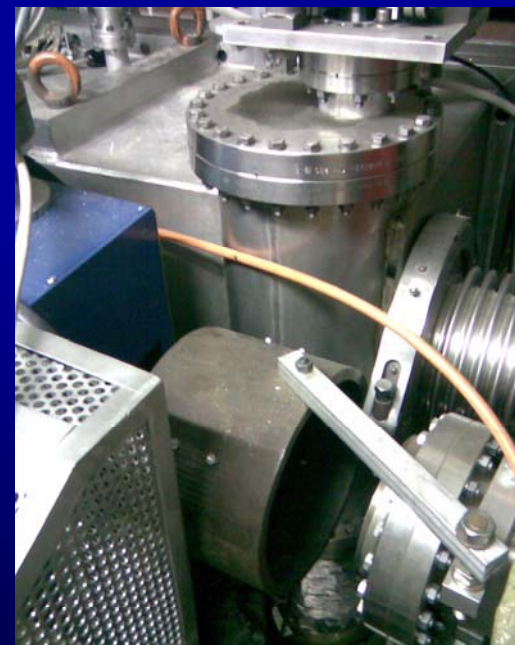
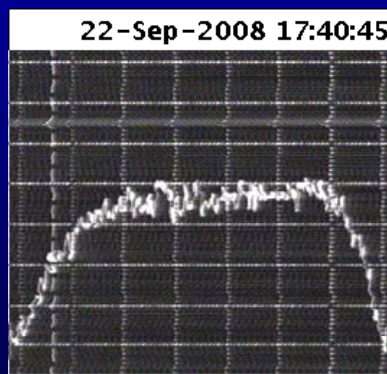
What was done in 2008

- Target: Alignment scans done, *same target in use since -99*
- Magnetic Horn: *Optimum current found to be lower than previously*. Horn lifetime improved after redesign (AC period), AD still uses the *same horn since -99*.
- Dogleg diagnostics: MTV:s badly suited for pbars (reverse proton loop decommissioned)
- Careful steering scans through dogleg
- No dogleg xverse acceptance limitation found, $A_{h,v} \geq \text{ring } A_{h,v}$.
- Injection scans kicker/septum: large margins
- Radiation survey of TT2,FTA and target area (target, horn, dogleg) shows no particular difference compared to 2007 levels



What was done in 2008

- Ring: h/v acceptances slightly smaller than before; 160pi vs. 180pi. Previous measurements shows that very few (a few %) high-amplitude particles are present
- Momentum acceptance:
strange df/f distribution was caused by misplaced TFA5302
No measurable intensity difference...
- df/f slightly lower than before => ??





What was done in 2008

- Power supply tracking at top energy? => delayed injection: no difference
- Orbits at 3.5 and 2 GeV/c: very close to reference
- Bunch Rotation: *Using only 1 (out of 2) cavities causes only a small degradation.* No precise measurements, but:
 - Smaller injected df/f ?
 - Careful tuning of all C10 parameters done
- Stochastic cooling:
 - Losses difficult to estimate
 - Final emittances correct



What to do in 2009

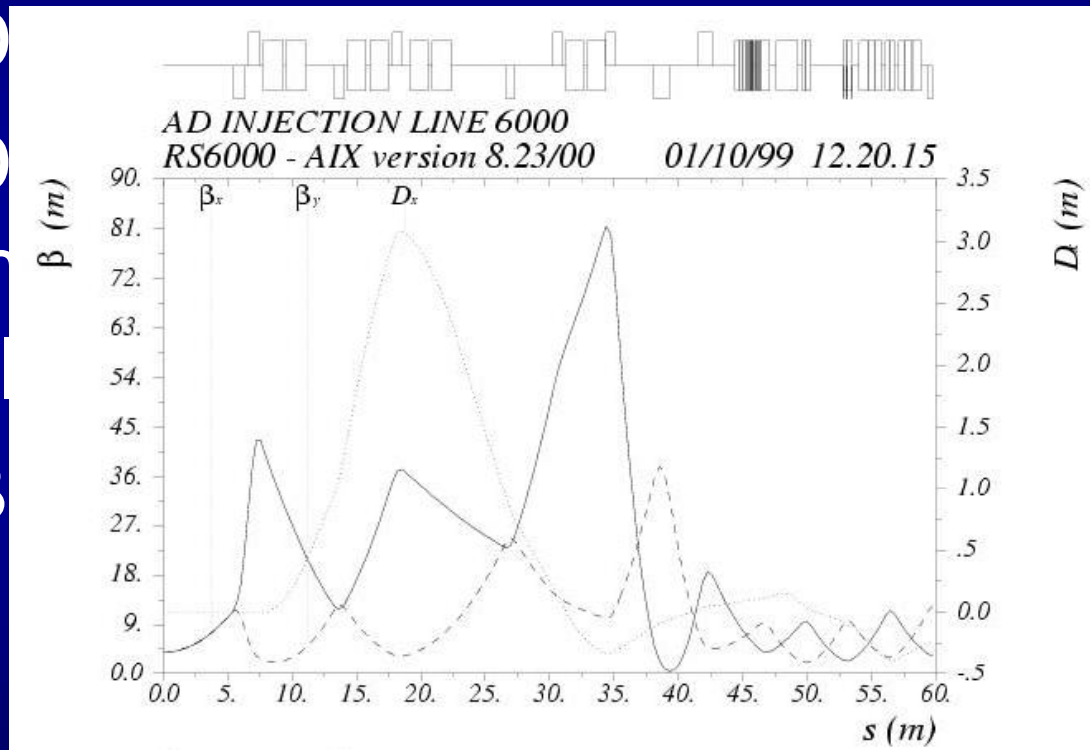
- Replace both target and horn: spare situation ok
- Stochastic cooling loss studies
- Re-iterate 2008 verifications...
- Further ring acceptance studies



Further issues/reflections

- Dogleg dp/p limitation ?

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- D
- m
- a
- B



) misalignment?
aced in 2008)
Z5402



Conclusion

- 4 weeks startup + md period planned:
 - Plenty of time for studies, but....Lets hope we'll not spend it on repairs....