

# Studies in the Injectors

APEX Workshop 1Nov07 ahrens

# Beam studies / development for 2008

- Most injectors study activity is tightly operations driven: the beam quality (intensity, transverse/longitudinal emittances, and for protons - polarization) delivered to RHIC.
- (but not all – Fischer's Au31, Mei's spin echoing).
- Surely healthy that “injectors” have several representatives in today's and tomorrow's talks.

# Looking at last years injectors APEX studies table:

- Had to removed at least 8 out of 19 items in the list of planned activities. Why?
- Gone (unfortunately): work toward a return to proton high intensity.
- Gone (fortunately) - finished! A lot of Au higher intensity work and the new foils.
- But also notice Gone: names (of two Operations members who have moved elsewhere).
- On to the table:

<b>Subject</b> <i>black:left over from last year</i> <i>blue: additional comments</i>	<b>motivation</b>	<b>Type</b>	<b>leader / players</b> <b>red: talk</b>
Model development / testing Booster, AGS, transfer lines new: “online” model emphasis, goal: feed model parameters to other applications (IPM, Orbit control)	Machine performance understanding. <i>AGS “bare” machine – mysteries decreasing: tune,chromaticity –maybe as close as we deserve, coupling (?)</i>	Study Com	Brown, <b>Schoefer</b> , Glenn,Morris / Ahrens
<i>Controlled machine optics deformations: messing with the beta functions in Booster, and with the beam divergence in AGS. Beam based checks on the results</i>	<i>All driven by need to improve the polarization of protons.</i>	Study Com	<b>Brown</b> , Ahrens, Glenn
Booster D6 septum magnet influence on booster injection <i>still open</i>	Coexistence with NSRL – <i>surely eating up Booster aperture.</i>	Study	Brown, Ahrens / Zeno, Operations
BtA transverse matching ongoing: need to have BtA model solid, <i>investigate against beta function distortion?</i>	AGS beam quality: intensity, hori – polarization	Com Setup	Glenn, Tsoupas, Brown
<i>AGS polarization improvement and polarization measurement improvement</i>	RHIC beam	Study Com Setup	<b>Huang</b> et al.

Subject (gold beam)	motivation	Type	leader / players
AGS Gold longitudinal emittance – Keeping it from growing in AGS at all: the merge?	low energy RHIC physics program (so far already small enough for RHIC, but maybe with the 9MHz cavity this changes)	Study	Pozdeyev /rf folk, ahrens
Transverse emittance cooling during AGS acceleration - well apparent <i>growth</i> (AtR flags)with intensity last run...	Hard to completely disprove some “cooling”, but harder to prove.	Study	Brown, Tsoupas, Ahrens,
AGS tune meter / coherence monitor basic tunes and measuring machinery ok, tbt fitting - chromaticity etc. still waiting.	more automated/robust up the AGS ramp tune measurement.	Com	Ahrens, ( Laster
AGS IPM	Cabling changes: more corrections, accept more model input	Com	Brown/ Skelly, Inst group
AGS equilibrium orbit control and display	hardware: fix missing BPM electronics, software: thorough revisit control, capability to accept model input	Com	Ahrens/ Laster, Inst group
AGS (proton) transverse emittance: CNI scan	proton emittance – one more view	Com	Huang/Yip, Nemesure

Subject (gold beam)	motivation	Type	leader / players
Booster and AGS Response Matrix measurements <i>data analyzed but not with            ORM machinery, nevertheless            informative</i>	understand Booster and AGS optics – is anything very different from the model? <i>Nothing yet.</i>	Study	Bai, Morris/Satogata, Schoefer
AtR arc trajectory tuning with RHIC at Store – <i>This is            “done”, a procedure exists, but            I think not much used.</i>	Maintain high transfer beam quality: transverse, intensity	Com	Glenn, Drees/ Operations
AtR new W line flags (thick, uniform) <i>this is surely done</i>	<i>redundant</i> Transverse emittance measurement	Study Com	Tsoupas/Glenn