Status Report on the AGS Preparation

L. Ahrens, BNL
October 22, 2002

for
RHIC Spin Collaboration Meeting XIII
RIKEN BNL Research Center

22Oct02 RSC meeting *L. Ahrens*

Revisit my transparencies from last RSC meeting (additions: bold italics)

Schedule: 7 Oct 02 gold beam in Booster (Booster recommish)

DONE, Worked very well

15 Oct 02 gold/ deuterium beam in AGS with Siemens Motor/Generator

In Process. Started with Westinghouse, but Siemens to come this week. Au in AGS, d in Booster. Plan: d in AGS starting this Saturday, 26Oct for a few days.

4 Nov 02 Iron in AGS (NASA biology run)

21Nov 02 Injectors setup for RHIC injection

1 Dec 02 RHIC Blue cold, deuterium into Blue. fill, fill, fill or fill and ramp, fill and ramp. no resting spaces.(but deuterium always in the AGS, and most of that beam doesn't go into RHIC. Probably could be available as another User – if Operations has any space in their head.

Yellow – gold into Yellow. probably no deuterium for a while. Then working on collisions.

mid Dec 02 Polarized protons in Linac, into HEBT to the 200 MeV polarimeter.

January 03 RHIC into physics runs (d,Au), injectors "mode switch" to polarized protons during stores. Plan for 3 (is there a constraint?) weeks of running in this pattern. This is the pre-run run.

Issues:

Linac:

200 MeV operation:

access into HEBT competes with Au/d operation (?)

a proposal to redefine boundaries to Radiation Areas is being presented to the RSC (that's the radiation safety committee) which would make this access more convenient. So work in progress.

measure 200 MeV polarization with 7Hz source pulse rate vs historic slow (1 Hz) pulsing.

(Anatoli Zelinsky +) Need the fast repetition rate if want to fill AGS with 6 bunches – for the internal polarimeter.

"commission" the 750 KeV chopper with beam from the polarized source. (Zelinski, Alessi, Brennan, Brisco, Zeno)

(issue: longitudinal emittance – last year ran Booster at h=2, two bunches accelerated, equally populated with beam and used only one of these, just to get a smaller beam in longitudinal phase space (.7 eVsec/n). The chopper which 'chops' the beam in time as it enters the Linac was ineffective for beam coming from the polarized source. This was (is) not understood. If the beam can be chopped, we have better control over the longitudinal phase space. Go back to h=1 operation. But also need smaller momentum spread out of Linac. Alessi has a program to attack this – at least gaining better understanding of the situation – diagnostics commissioning etc.

Booster:

Booster is the "easy" measurer of the longitudinal quality of the Linac beam. Can we inject into Booster before January?

Some serious orbit distortions possible due to the BAF construction. Reopens the possibility of losing polarization in Booster. (Equilibrium orbit measuring system being commissioned.)

Equilibrium Orbit measuring system still being put together. This is an 'unessential' diagnostic system, so struggles for priority.

The test will be polarization at AGS injection (1.5 GeV kinetic or slightly higher). Polarization should equal 200 MeV measurement. Old polarimeter.

Booster tune control, tune measurements all required for BAF commissioning so should already be there. Standard drill to optimize – or show degradation if move (4th 5th orbit harmonics, vertical betatron tune) away from optimal.

AGS:

changes:

1) back to the higher acceleration rate of the Siemens motor-generator set.
2) new magnet hardware for the (ac dipole/tune meter) both vertical and horizontal.

Tune Meter/ ac Dipole installed (pic), not yet powered. AC dipole has two remotely switchable frequency choices. (Mei)

3) CNI Polarimeter

CNI polarimeter installed in AGS (pics). System about ready to comment on the issue of beam noise. (Haixin)

any immediate acceleration strategy changes?
nope. Set up as in last Siemens (higher acceleration rate) run (2000) – well nearly (betatron tune space).

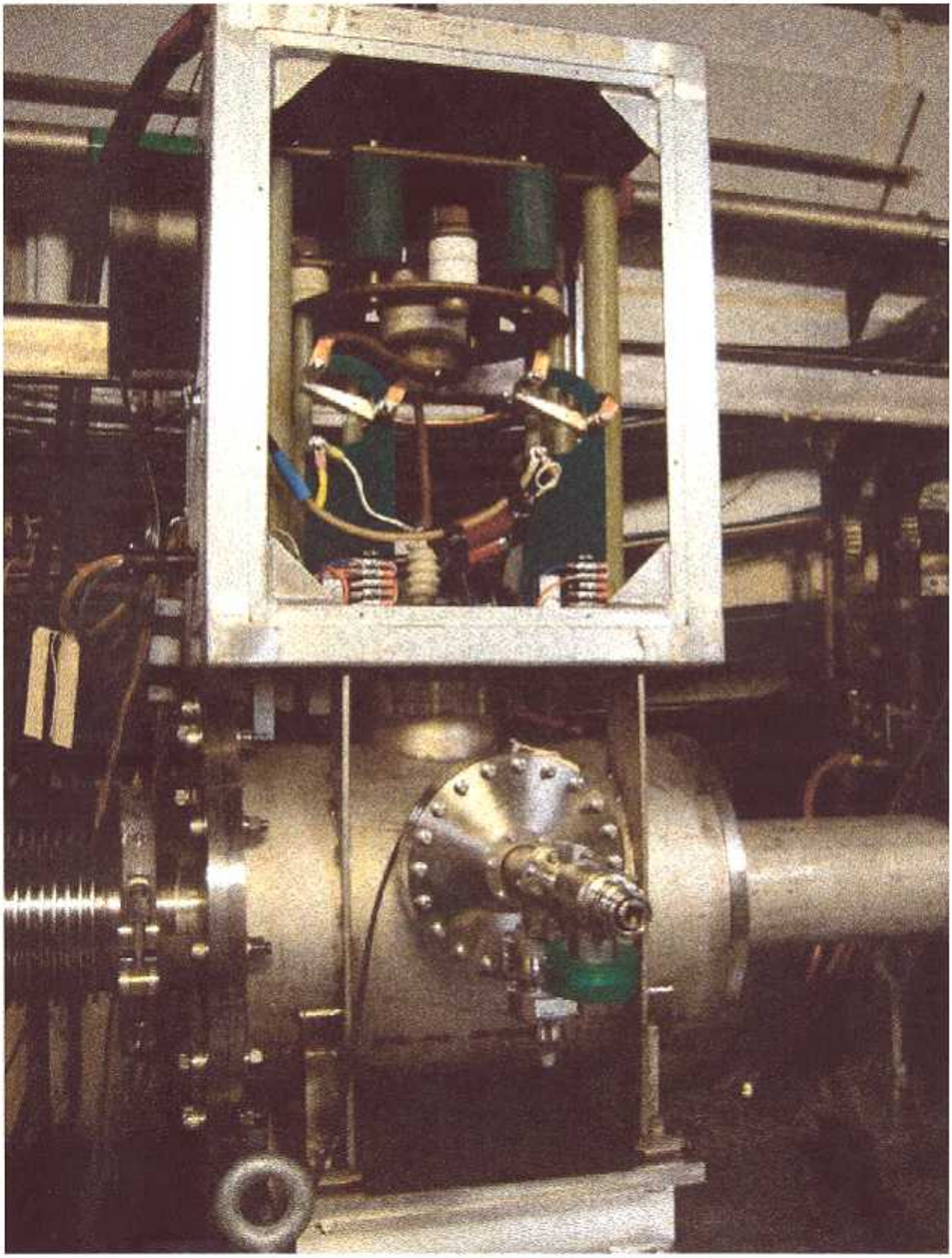
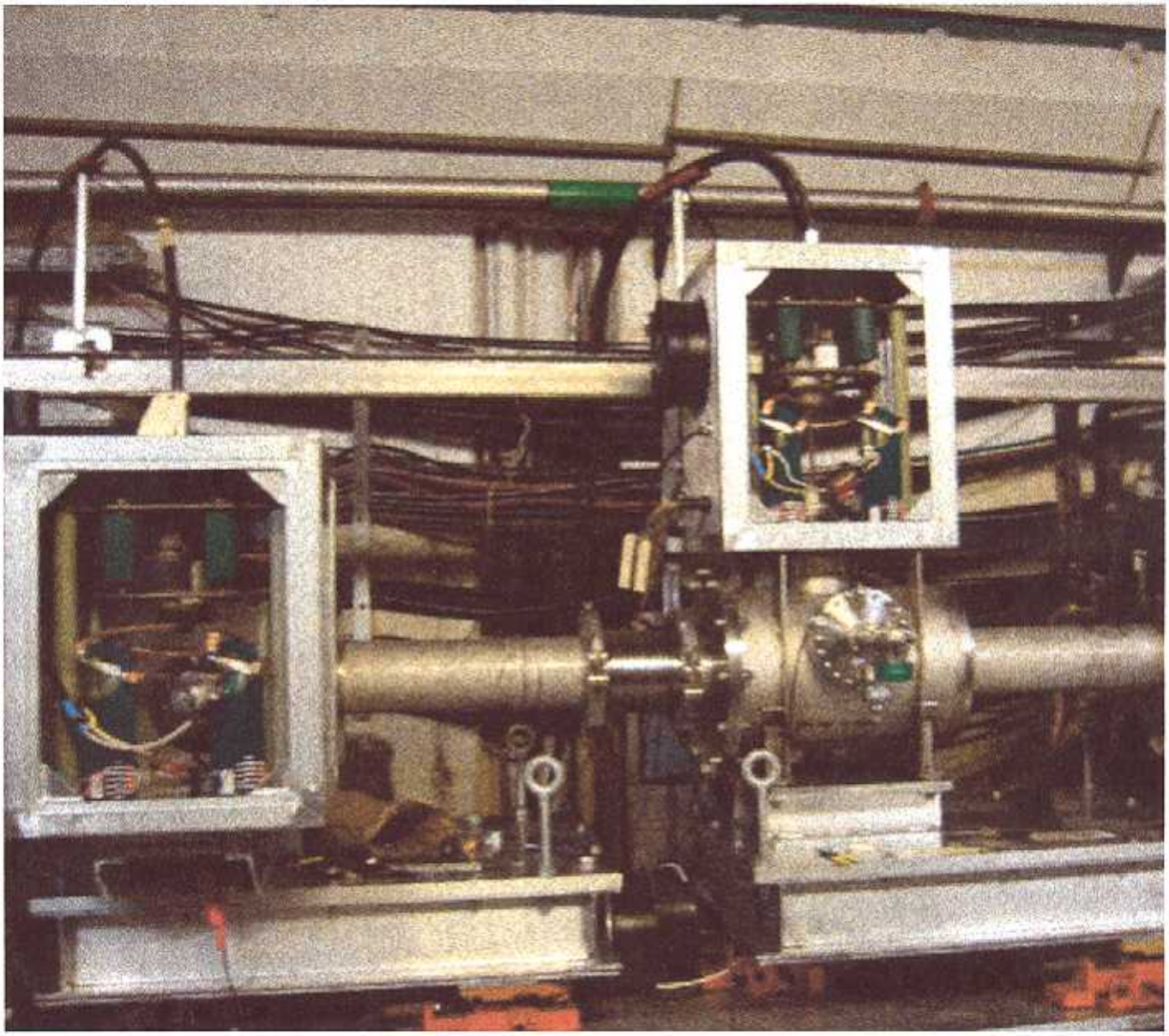
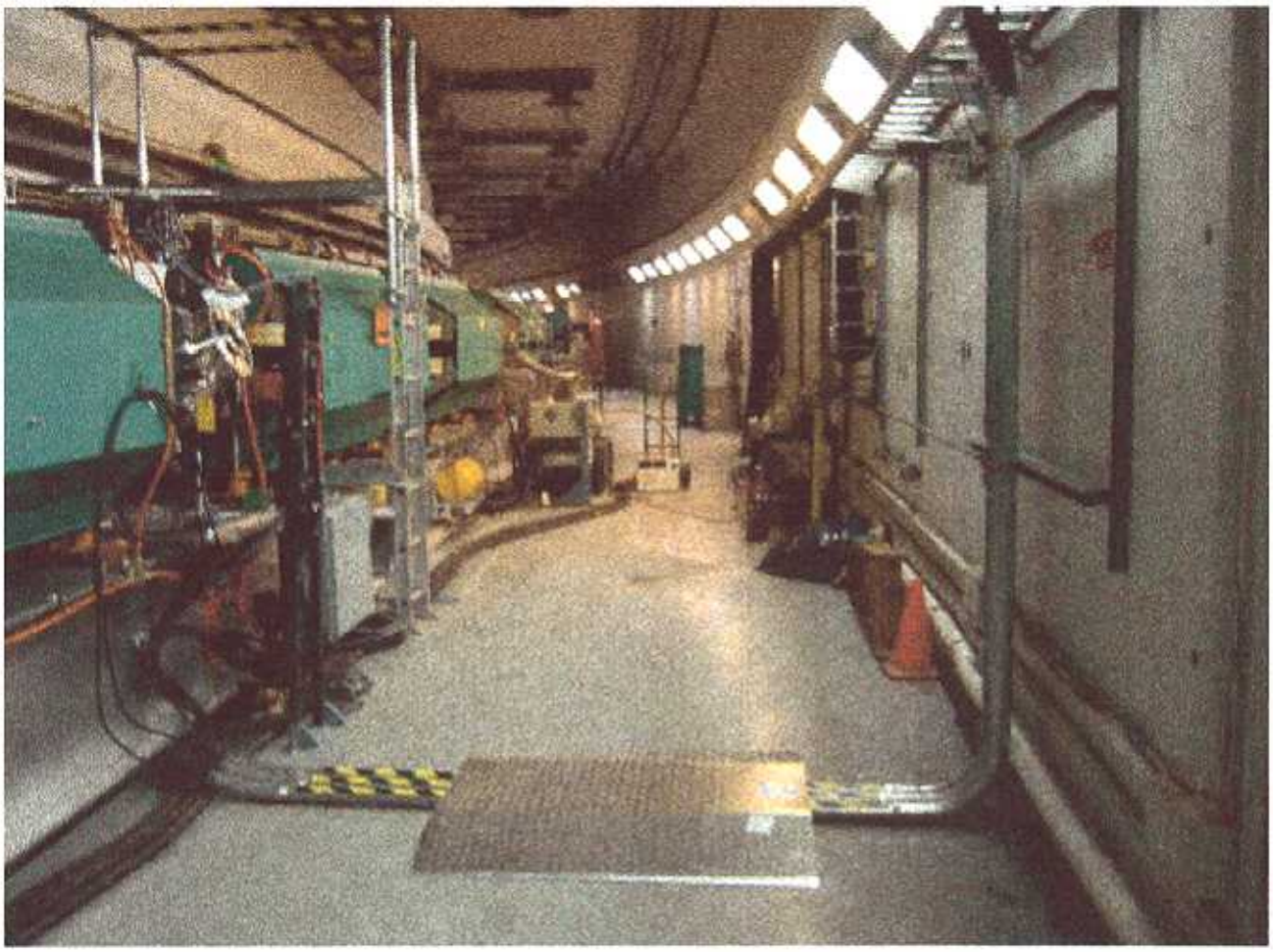
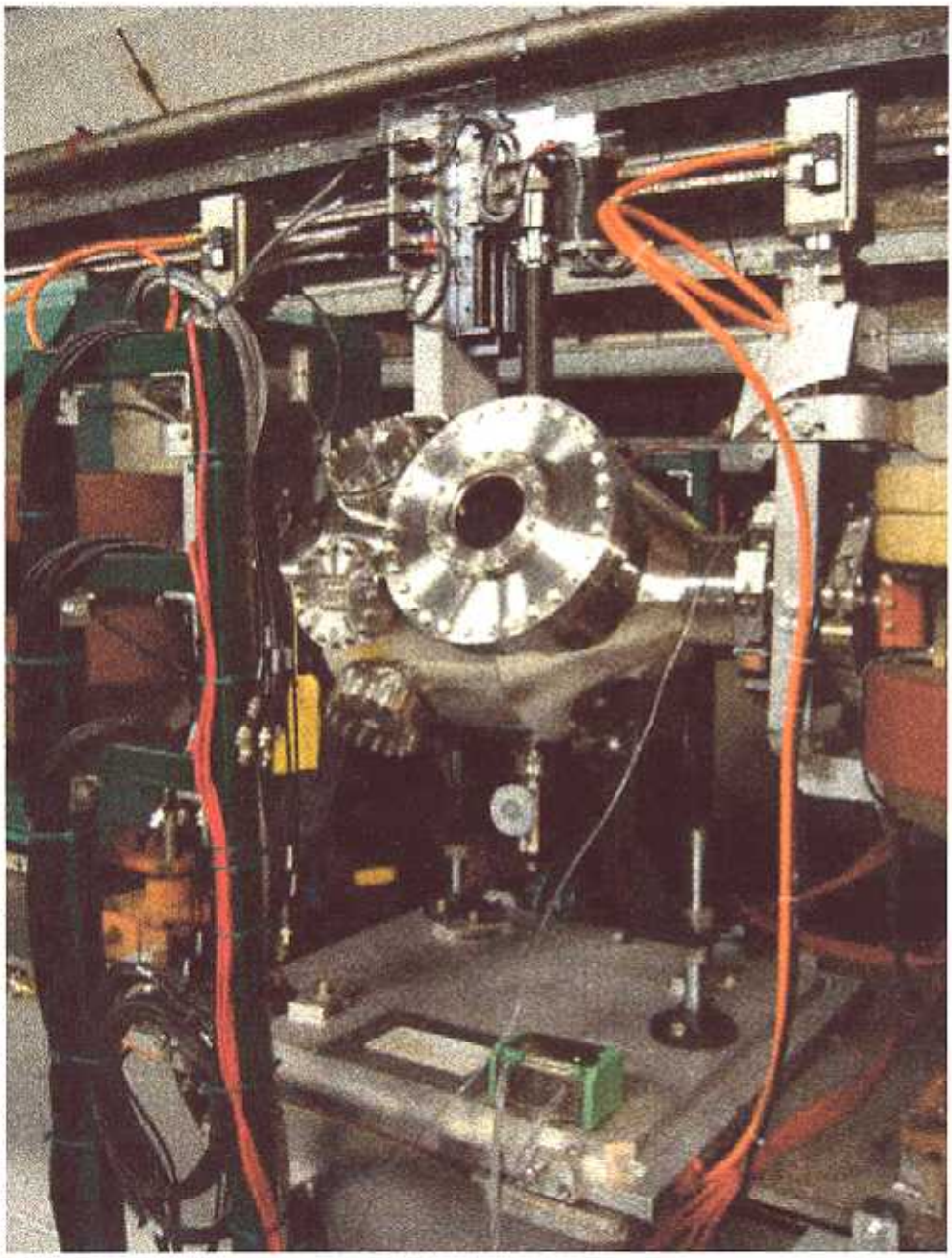
comments:

unpolarized work:

satisfactory calibration of the (magnetic field measuring system / AGS average orbit measurement) last run. This cal should be redone during the RHIC setup period, and we should set the ac dipole intervals with the best confidence yet – not that we won't try to check with timing scans.

Equilibrium orbit correction – nothing new, but simplify if possible.

where should we live in tune space?

Where can we go in tune space (without beam loss ... without emittance growth) (skew sextupole resonance line Qy+2Qx=26?) Understanding this is valuable prework for later polarization optimization.
(Not attacked yet)

Workshop: AGS Polarization Upgrades in early November: stay tuned