

# AGS pp Status

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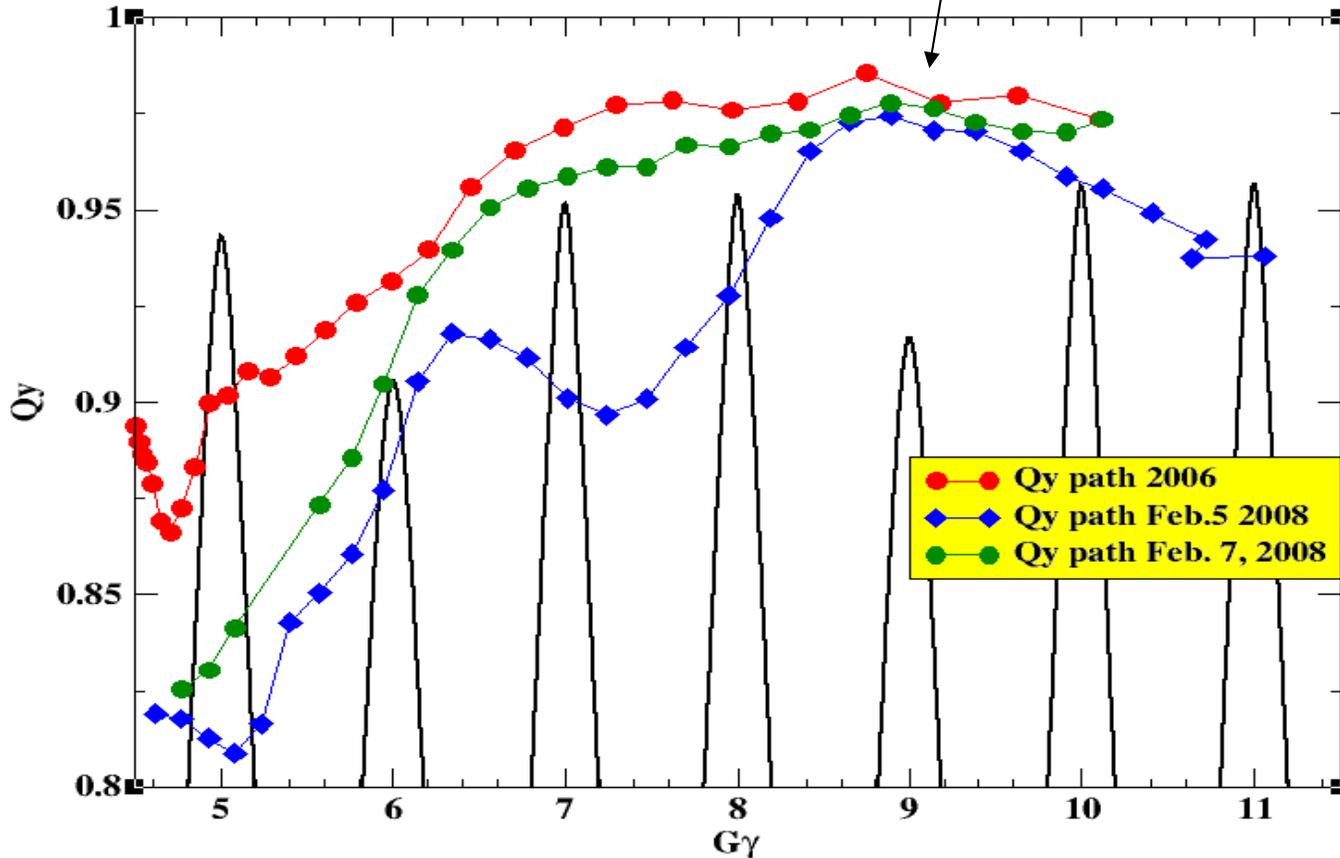
Feb. 26, 2008  
Phil's Meeting

# AGS Vertical Tune near Injection

No difference in polarization measurements between The blue and green.

Right now it is 8.977 at 0+nu

Vertical tune path  
10% CS + 5.9% WS

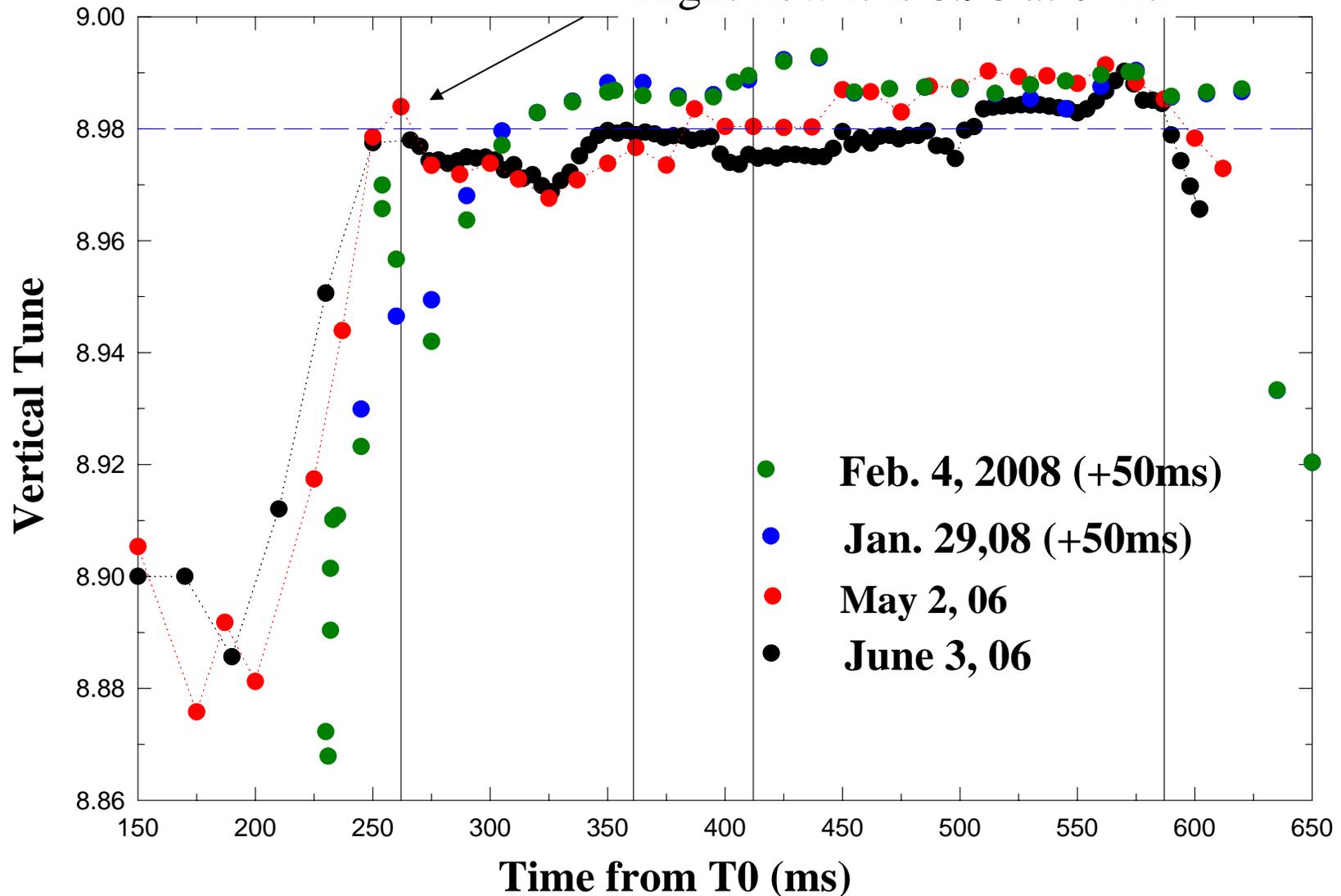


# AGS and Booster Lattices

- The vertical tunes are as high as in run6 for strong intrinsic resonances
- $\sin 9v$  has been raised high at 36+.
- $v_y$  at 0+ as high as 8.98
- Booster harmonics seem OK.
- Injection-on-the-fly lattice. The ramp speed at  $G\gamma=5$  is about 3 times faster.

# AGS Vertical Tune along Ramp

Right now it is 8.98 at 0+nu



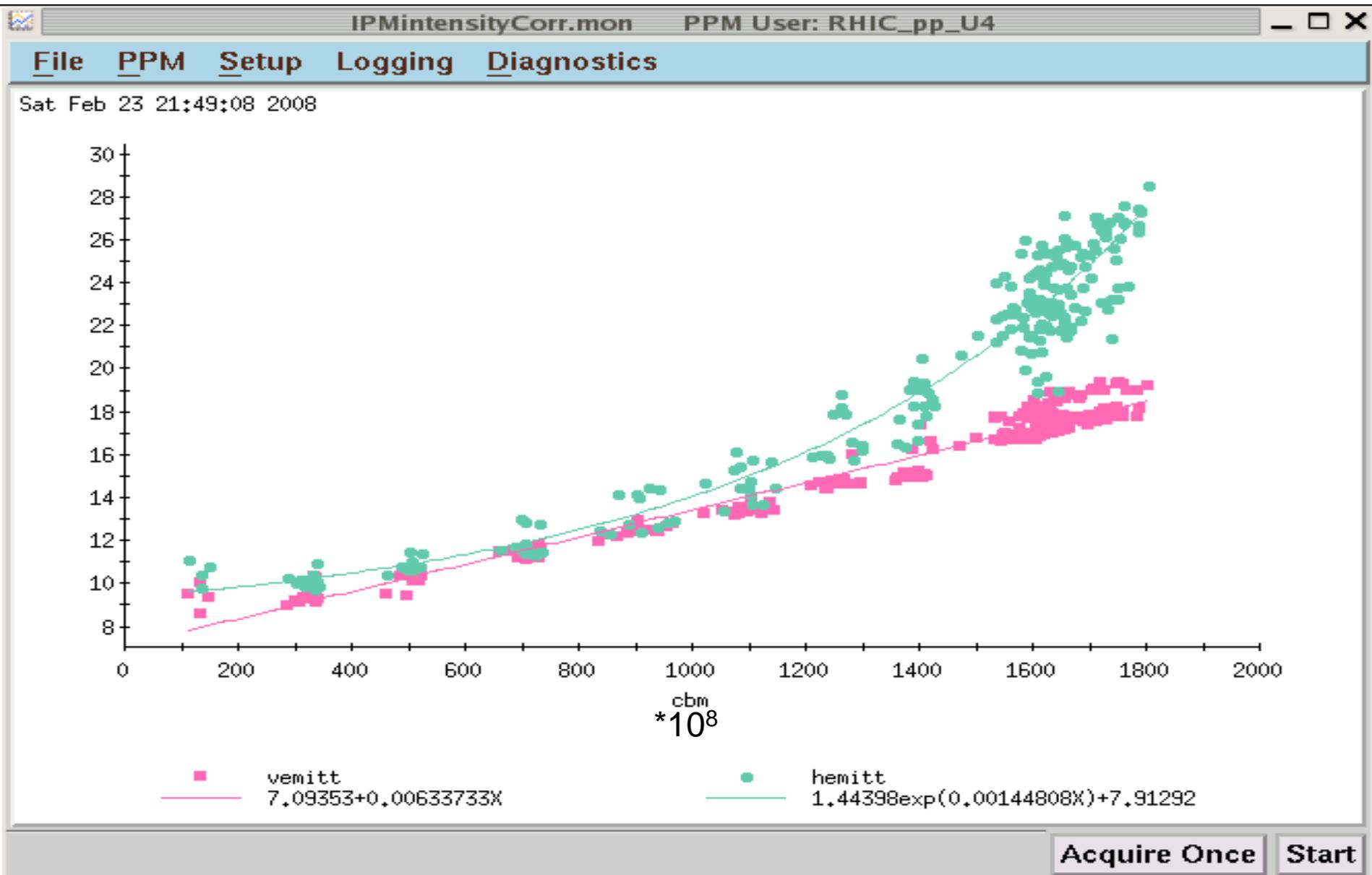
# Emittance with Injection-on-the-Fly

- The injection-on-the-fly seems to have larger aperture at injection, since the emittance blow up as indicated by jump target study did not cause much beam loss.
- On the other hand, it is clear from the jump target study (scraping beam after transition) that there is emittance growth correlated with intensity increase: we could not generate a bright beam. There is emittance growth early in the cycle. A down ramp emittance measurement also points to the early part of the cycle for the growth. BtA match study is not conclusive but no big mis-match observed there. All of these hint that it could be due to either space charge or instability near injection.
- The beam emittance (rf off at flattop) are different now from run6:

Now	H $16\pi$ , V $13\pi$	with $1.3 \times 10^{11}$
5/11/06	H $11.4\pi$ V $16\pi$	with $1.6 \times 10^{11}$
5/12/06	H $10.4\pi$ V $15.2\pi$	with $1.36 \times 10^{11}$

The larger horizontal emittance is likely one factor of stronger polarization profile observed in the AGS.

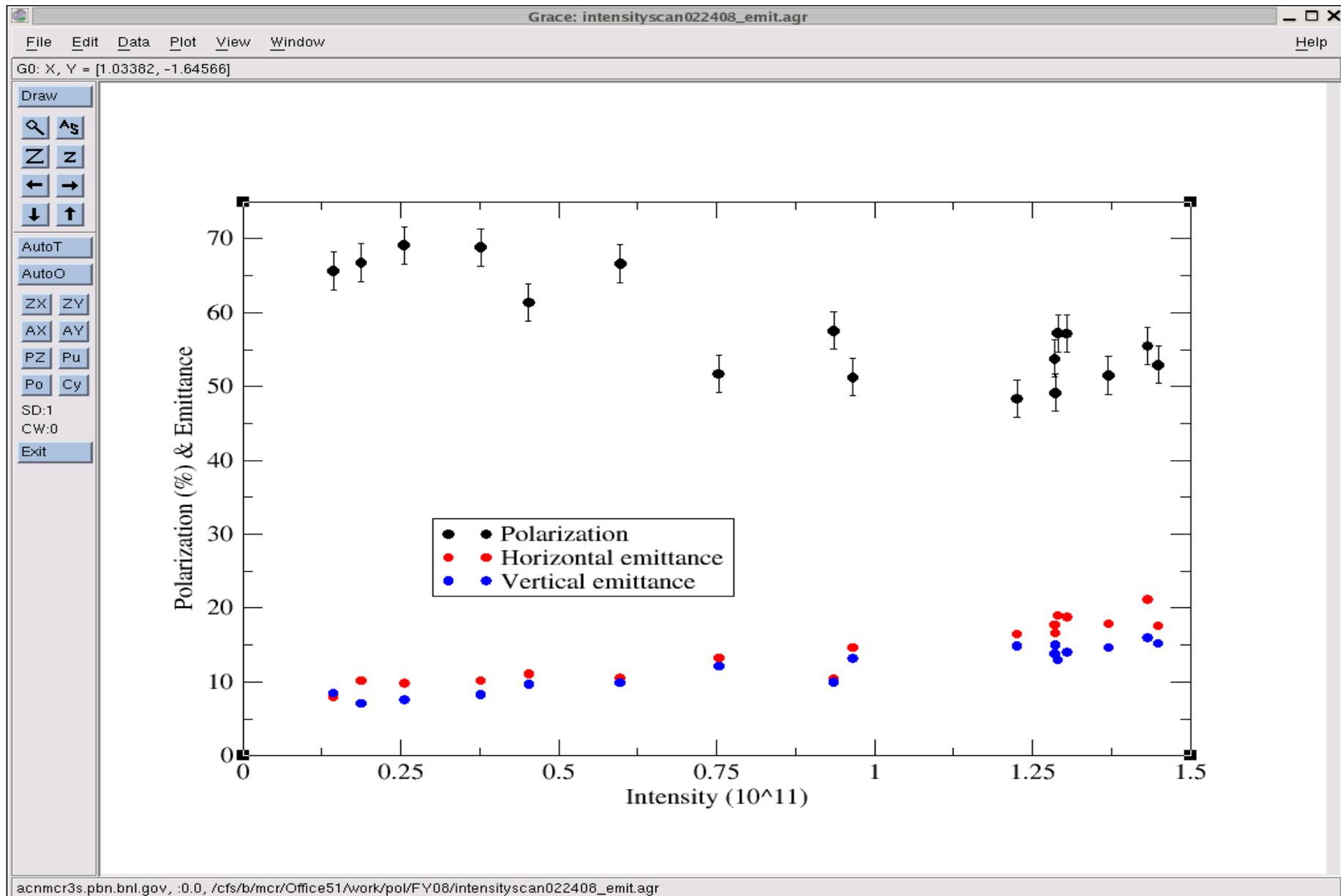
# AGS Emittance at Extraction



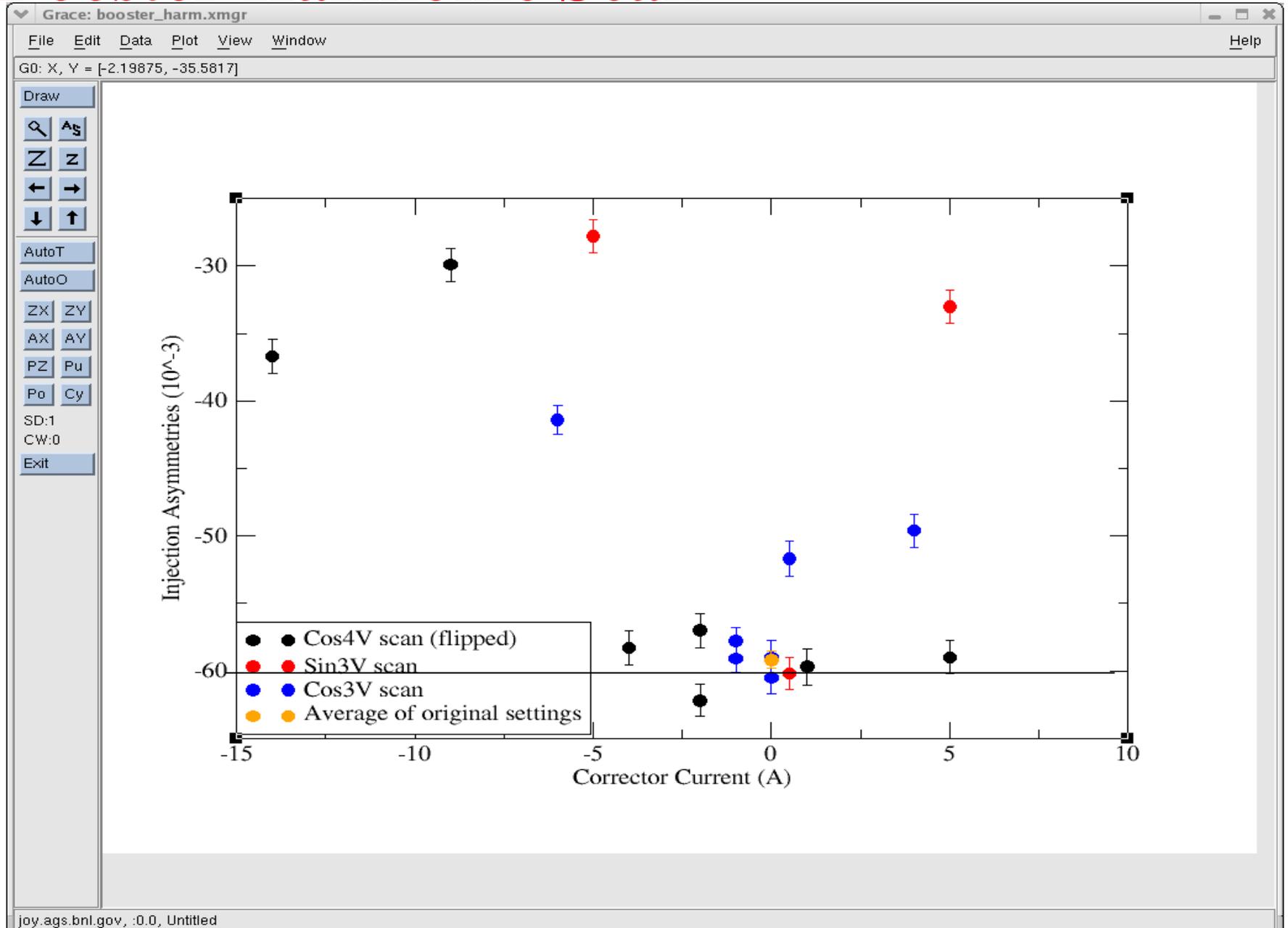
# Polarization of AGS Injection-on-the-Fly

- The injection measurements with e880 polarimeter (last Tuesday) indicate there is polarization loss before or right at AGS injection. The asymmetries are 59-60 vs. 64 in run6. We have a relative 7% difference. We will recheck it.
- Two horizontal polarization profiles taken shown a stronger profiles than the ones in run6.
- The intensity scan with chopper width shows a step in polarization vs. emittance.
- The larger horizontal emittance is likely one factor of stronger polarization profile observed in the AGS.
- Polarization level drifted from high 50s down to low 50s with similar intensity.
- Possible problems:
  - harmonics around 36+ keeps drifting.
  - hybrid resonance  $60-9-\nu_x$  which is affected by both horizontal emittance and vertical harmonics (Thomas). Will look at it.

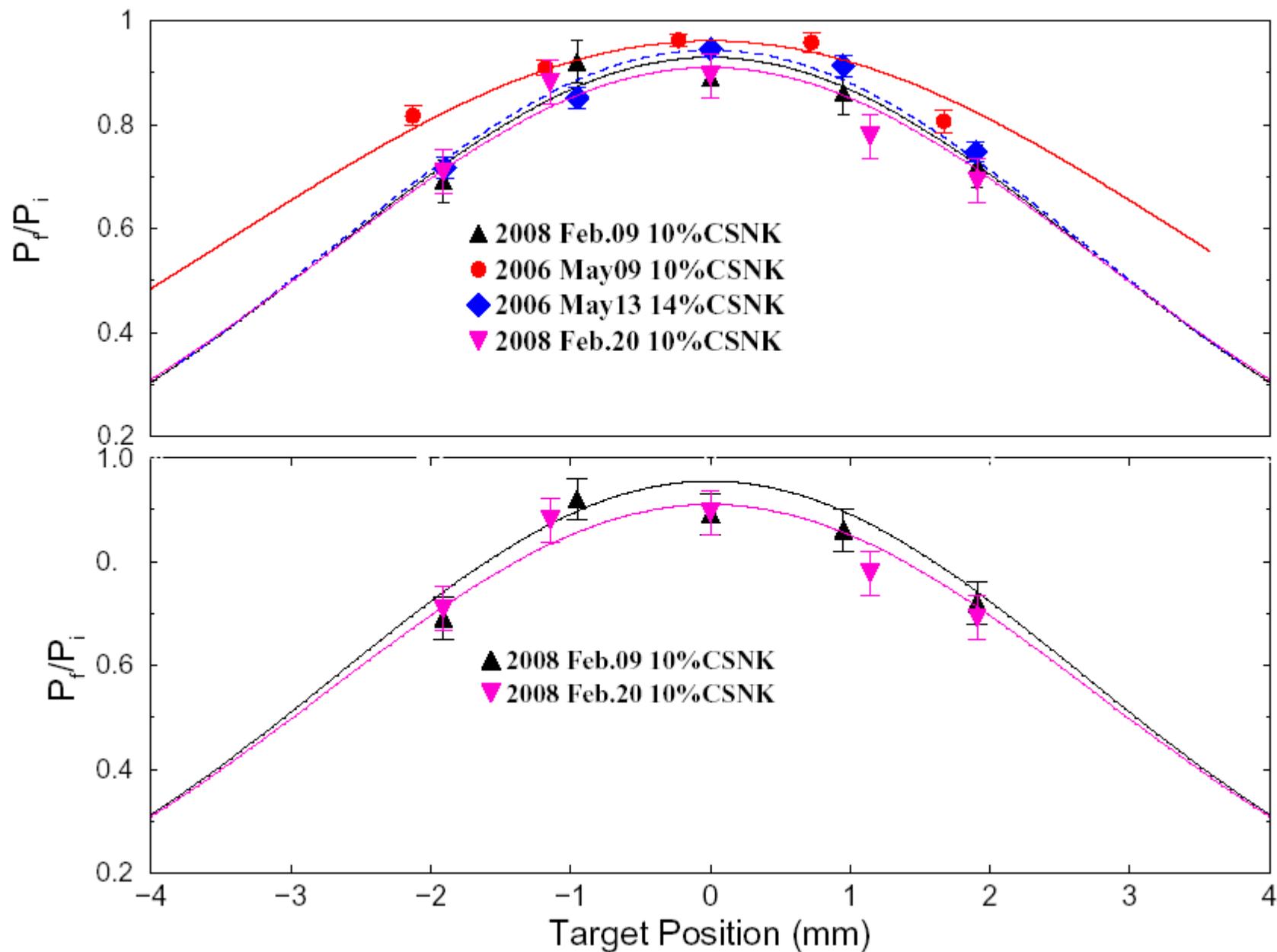
# AGS Intensity Scan



# Booster Harmonic Scan



# AGS Horizontal Polarization Profiles



# Plan

- Set up run6 lattice in AGS user2. Check polarization and emittances. If they are better, switch to user2 for RHIC injection.
- Injection-on-the-fly: We will increase the AGS injection energy to quantify the effect of the emittance growth.
- Jump target study with user2 and user4 (higher injection energy).
- BtA match study for both users.