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## *APS Lattice Information Update*

*Michael Borland  
Operations and Analysis Group  
Accelerator Systems Division  
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U.S. Department  
of Energy



A U.S. Department of Energy laboratory  
managed by The University of Chicago

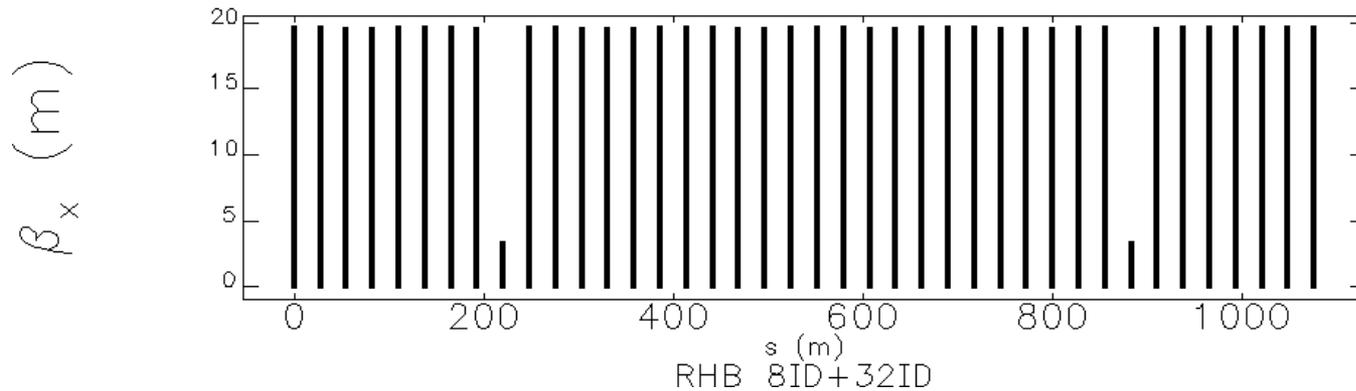
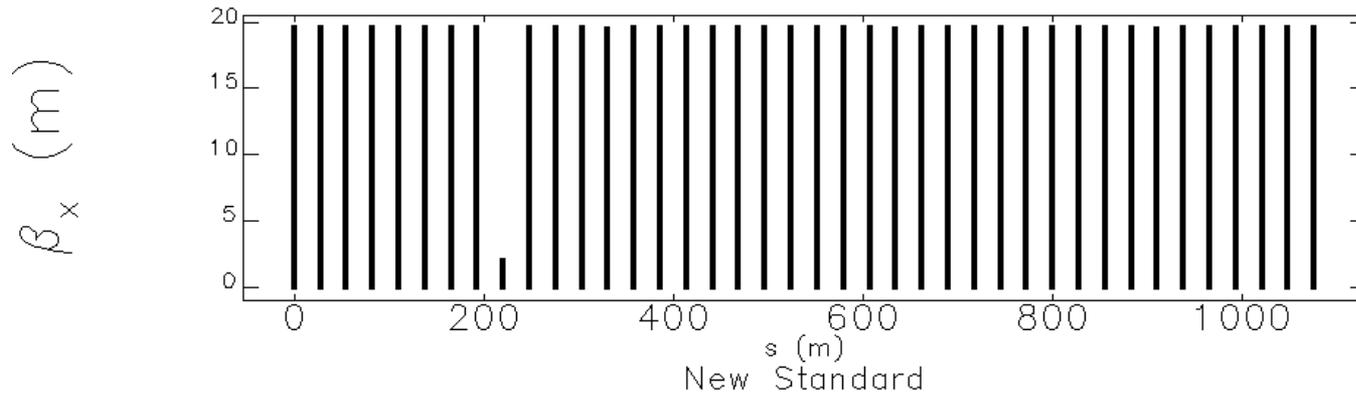
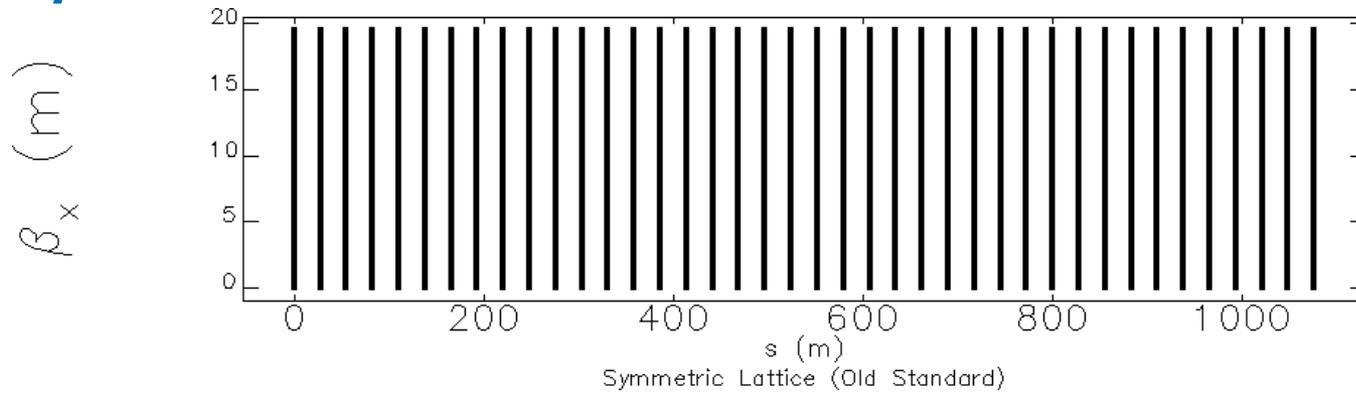
# Contents

- Lattice changes for this run
- Operational readiness
- Beam tilt issue.

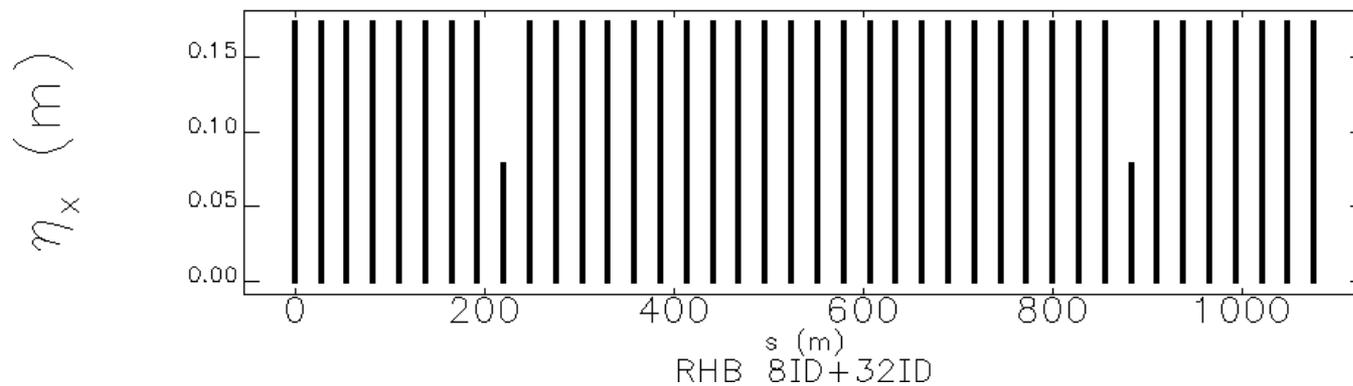
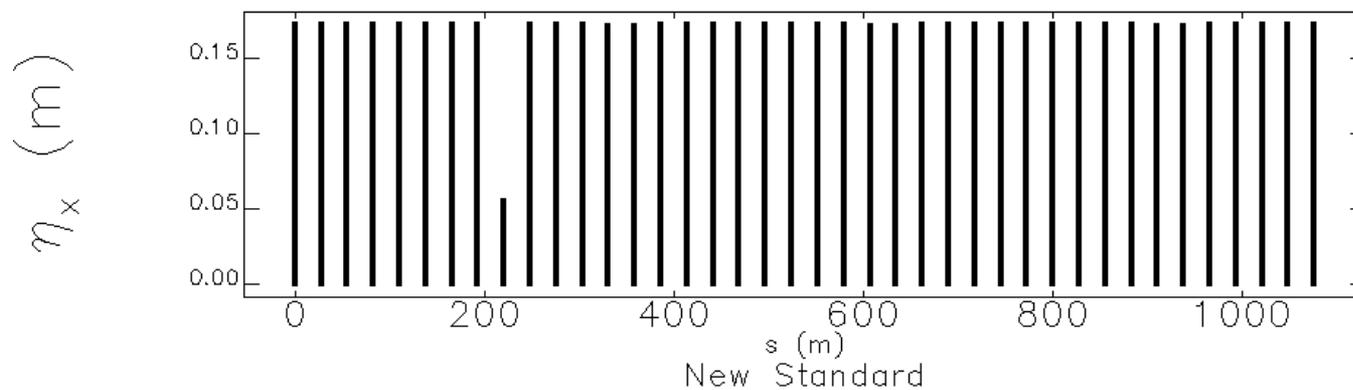
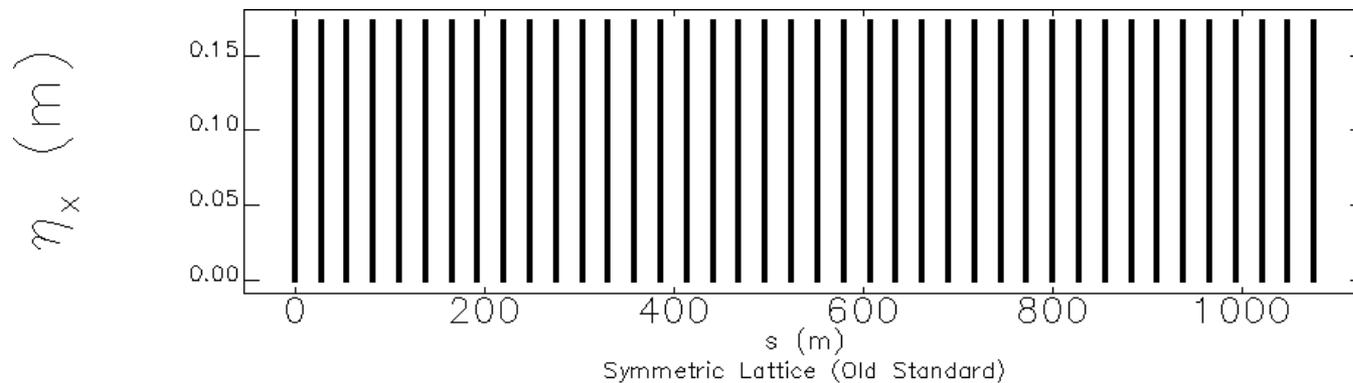
# Lattice Changes This Run

- Standard Lattice
  - The standard APS lattice has changed this run
  - Old standard lattice was symmetric (same in all sectors)
  - New standard lattice has reduced beamsize for 8 ID
    - *Emittance increases by 8%*
- RHB Lattice
  - This is the same as last run: reduced horizontal beamsize at 8ID and 32ID
- The schedule page will be updated to include more information about lattices for present and past runs.

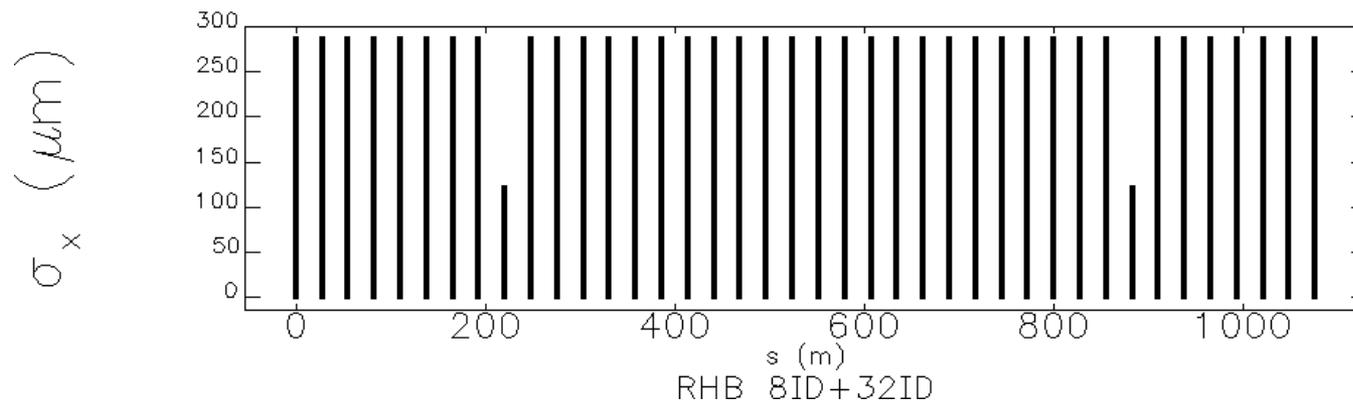
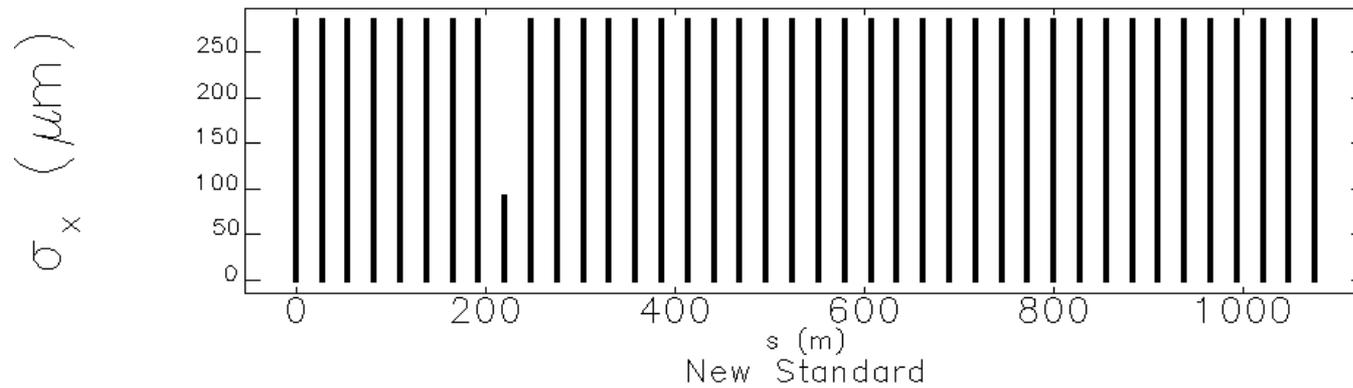
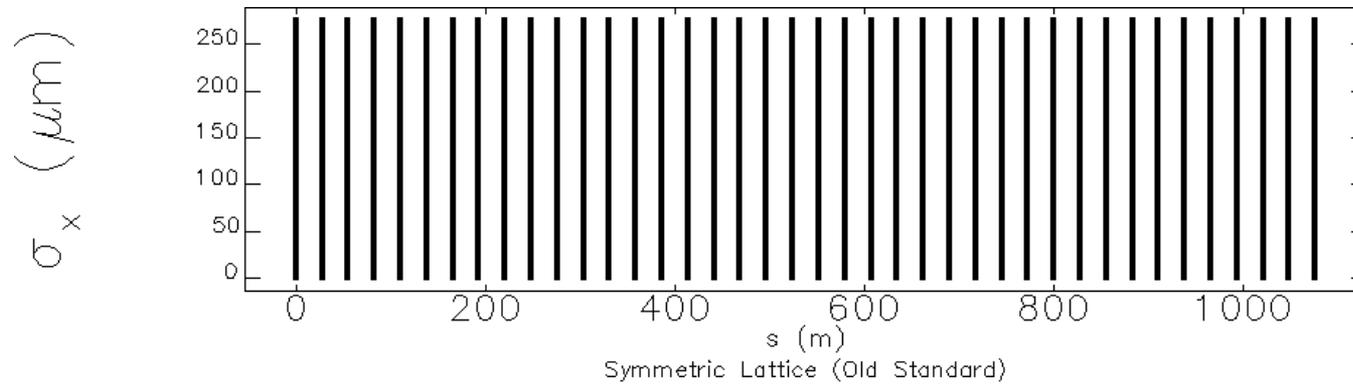
# Comparison of Horizontal Beta Function at IDs



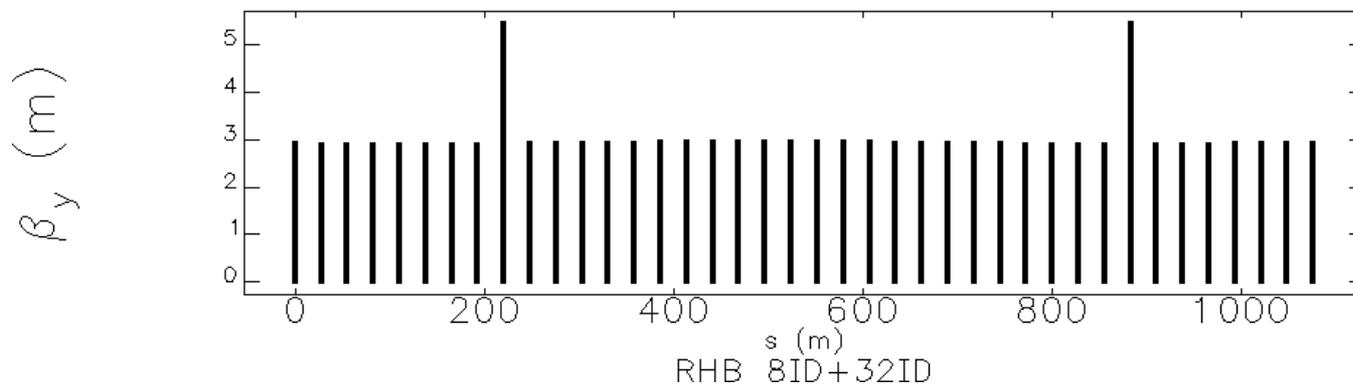
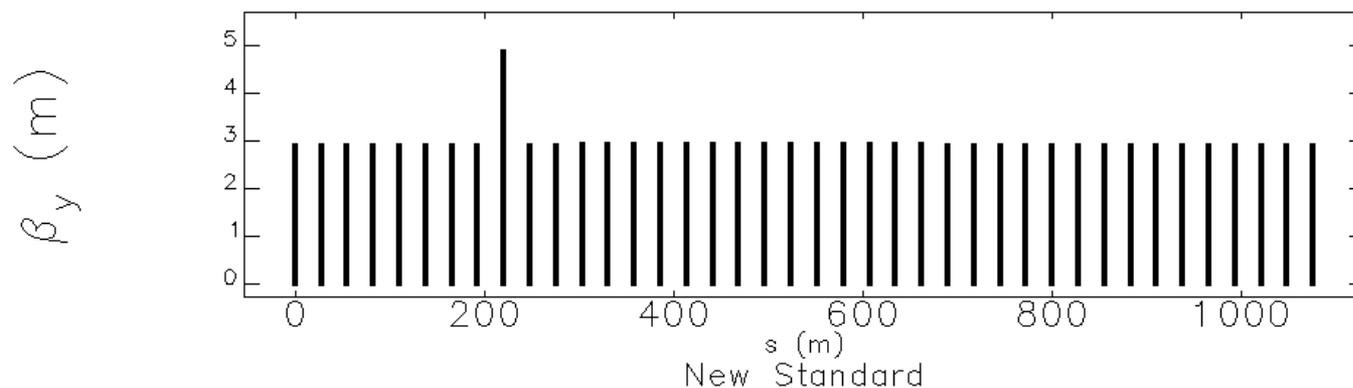
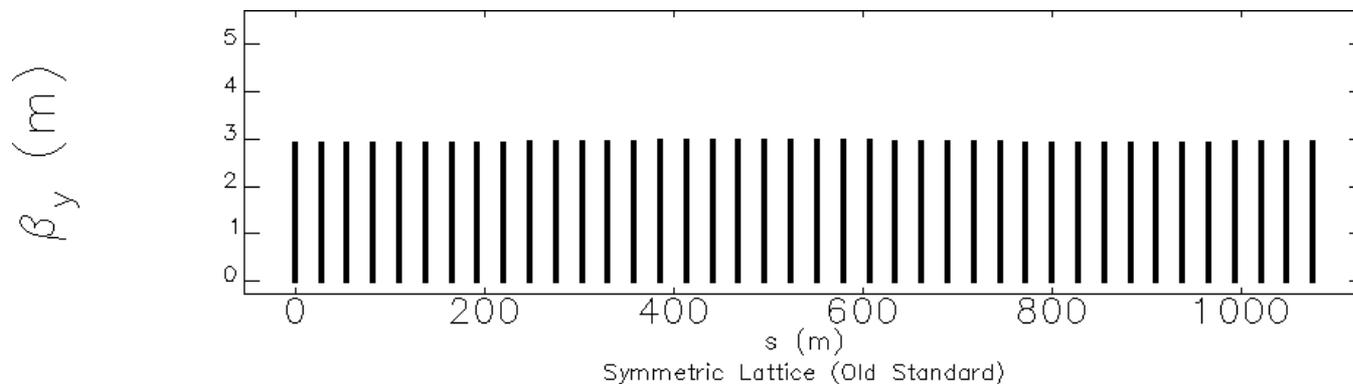
# Comparison of Horizontal Dispersion Function at IDs



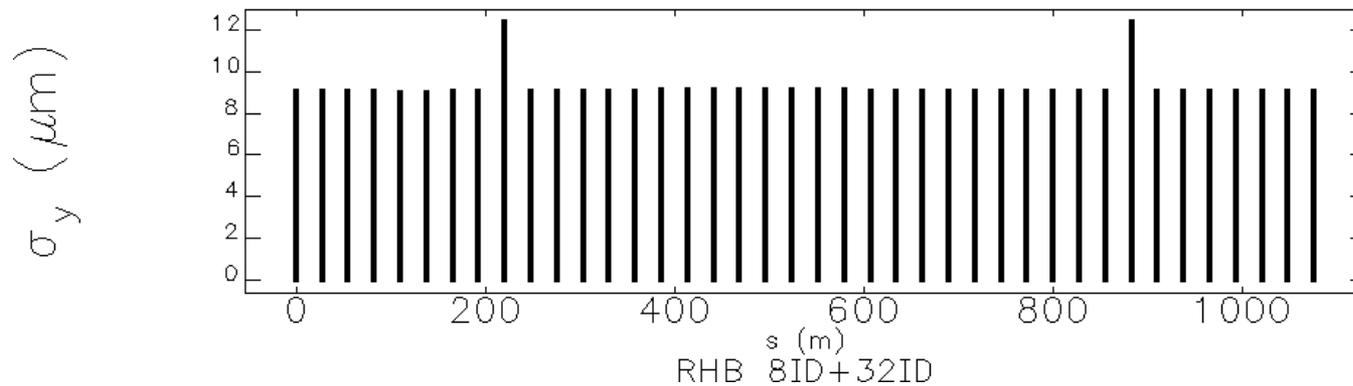
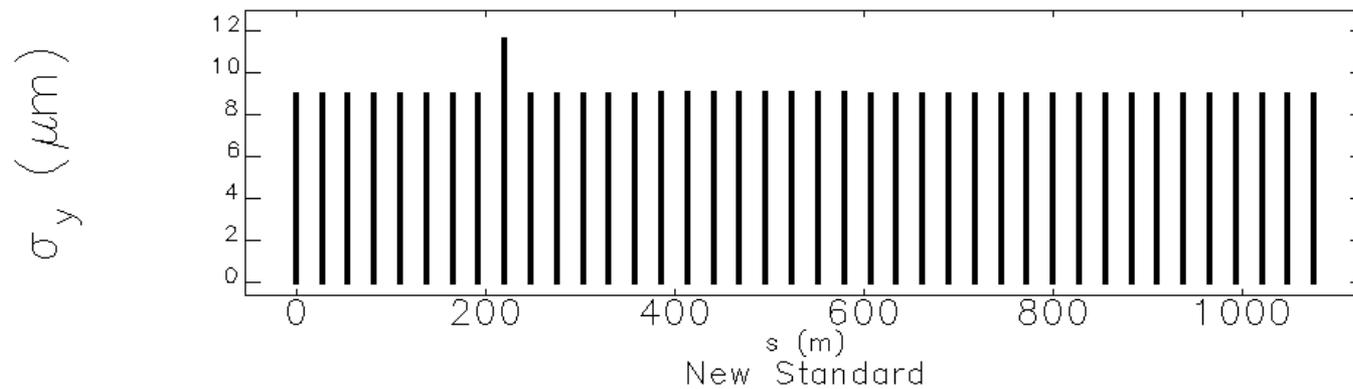
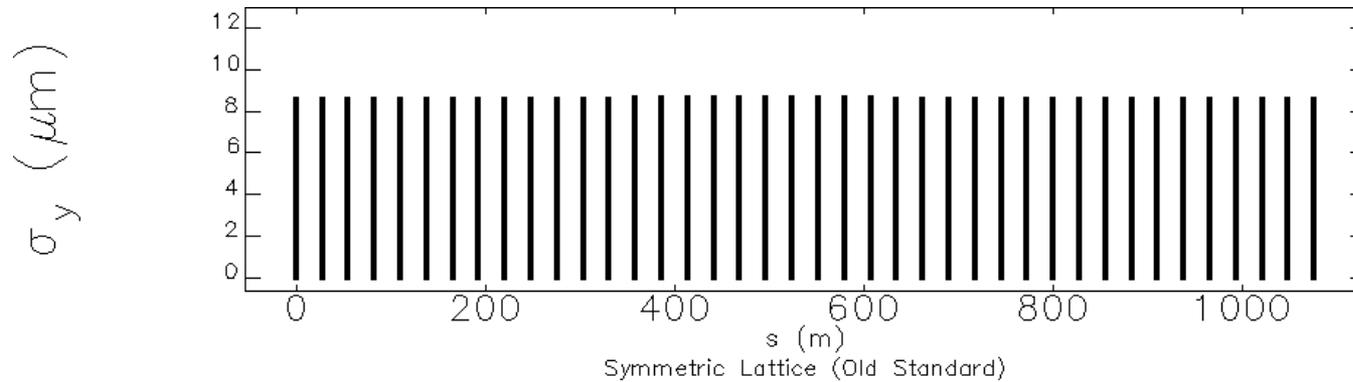
# Comparison of Horizontal Beam Size at IDs



# Comparison of Vertical Beta Function at IDs



# Comparison of Vertical Beam Size at IDs



# Operational Readiness

- Based on experience from last run, we had two “operational readiness” periods during start-up
  - This is an attempt to detect operational problems before user beam time starts
  - In the past these were too close to the start of operations to really allow solving problems
  - Essential machine studies completed prior to these periods
  - Accelerator operators run top-up as if for user operations
- Some issues discovered
  - Emittance oscillation, tracked to baseline problem on video system
  - Lifetime shorter than desired
    - *Top-up is able to keep up*
    - *Will attempt to improve this evening.*

## Beam Tilt Issue

- Several beamlines have reported seeing an x-y tilt on the beam
  - Results from having only a single location for observing the tilt for machine correction studies
- Progress on this issue
  - Able to match vertical beamsizes measurements from 35BM using accelerator model<sup>1</sup>
  - Attempted fast measurement of x-y coupling at all BPMs using realtime feedback system<sup>2</sup>
    - *Identified synchronization issues that need attention*
- Plans
  - Include beam tilts on the source parameters page
  - Implement fast x-y coupling measurement at all BPMs
  - Develop method for correction (limited number of correctors)

<sup>1</sup>V. Sajaev, M. Borland, ASD/APG/2006-15, 7/21/2006.

<sup>2</sup>L. Emery, V. Sajaev, A. Xiao, 8/15/2006 studies.