

# Start-to-end CeC Simulations

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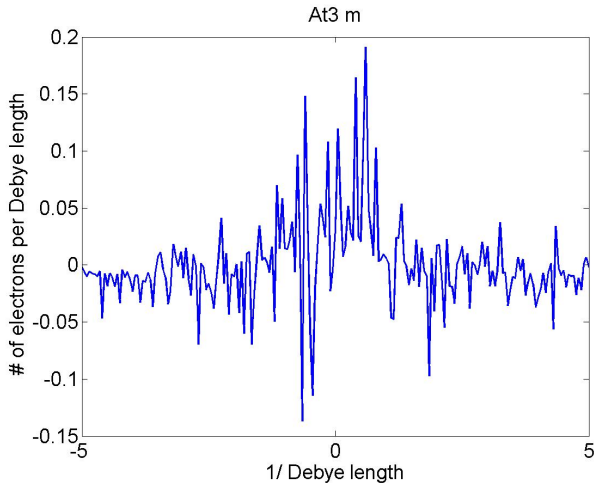
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2016.8.18

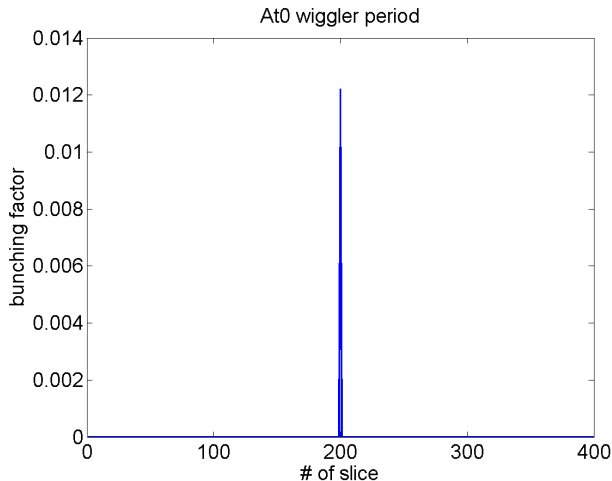
- Run GENESIS for 1 wiggler period to generate particles for 400 slices (Short noise = 0, 1)
- Replace one slice with distribution from modulator simulations (background beam and modulated beam)
- Run GENESIS with replaced slice
- Take difference between background beam and modulated beam
- Take the output of GENESIS as the input of kicker simulation (background beam and modulated beam)
- Run kicker simulation
- Take difference between background beam and modulated beam

- Number of computational particles :  $2e+4$
- Representing number :  $6e+2$

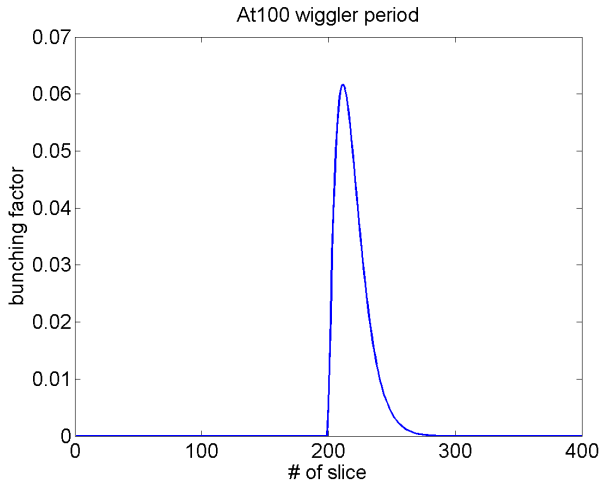
# Density modulation



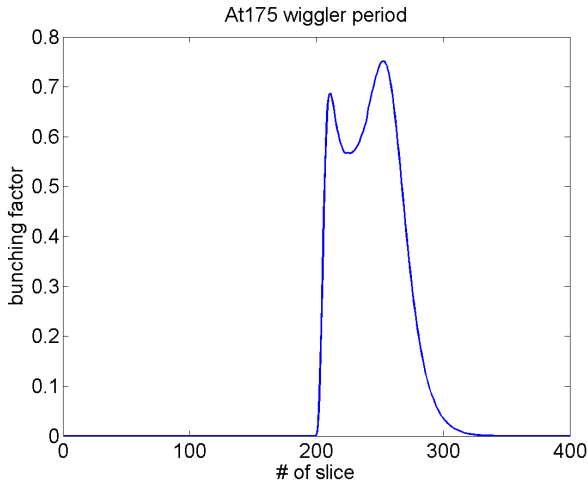
# Bunching factor evolution



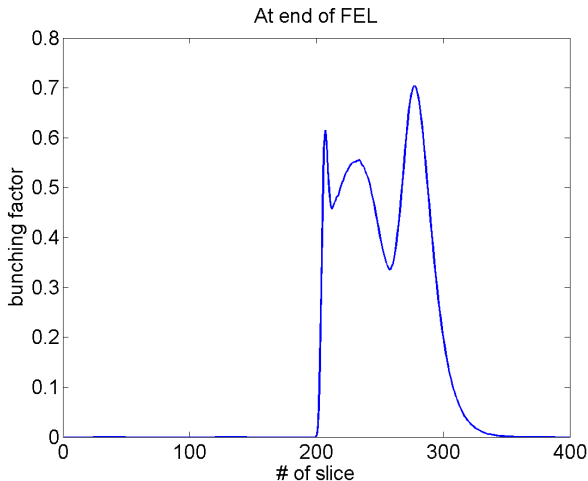
# Bunching factor evolution



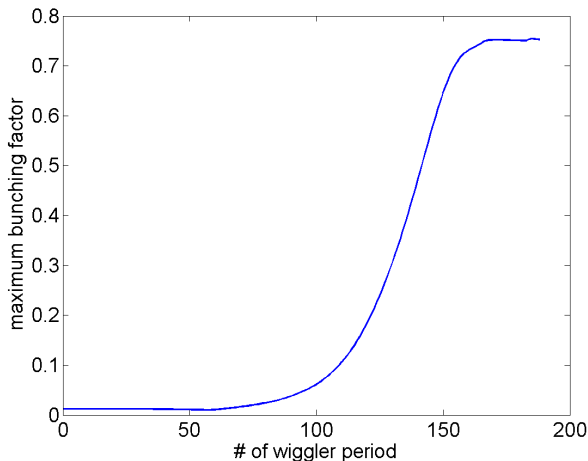
# Bunching factor evolution



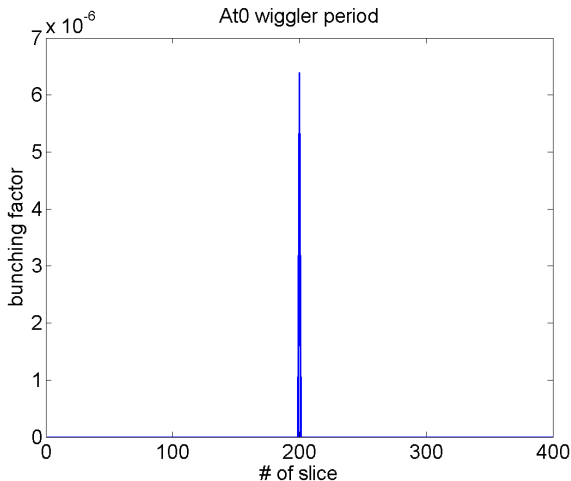
## Bunching factor evolution



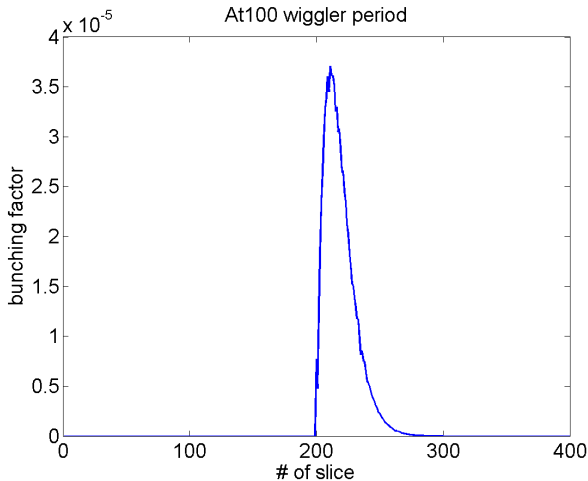
## Bunching factor change along time



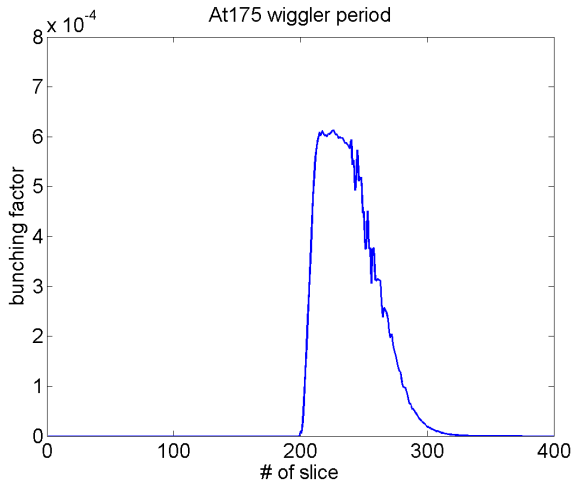
## Bunching factor difference evolution



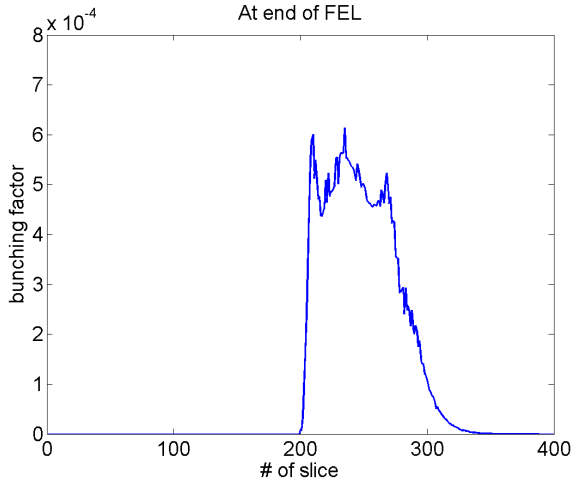
## Bunching factor difference evolution



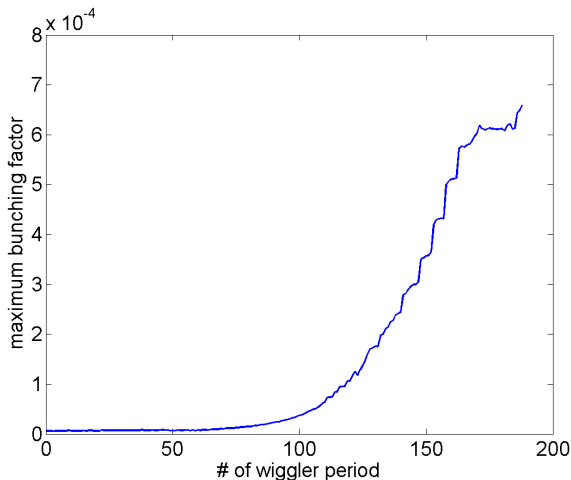
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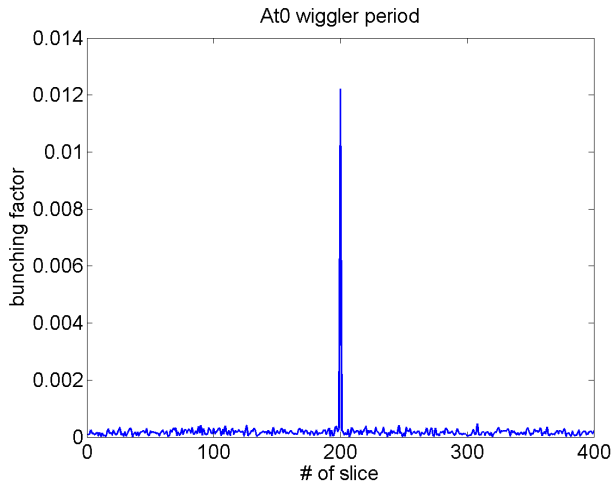
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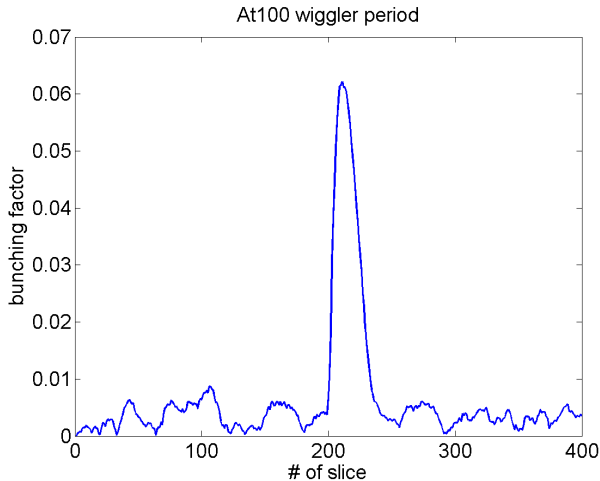
## Bunching factor difference change along time



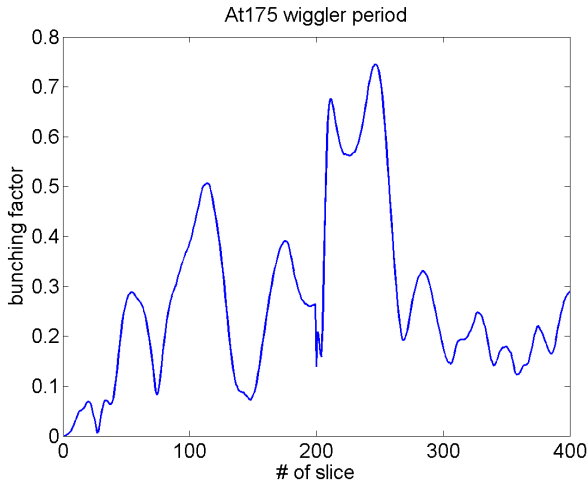
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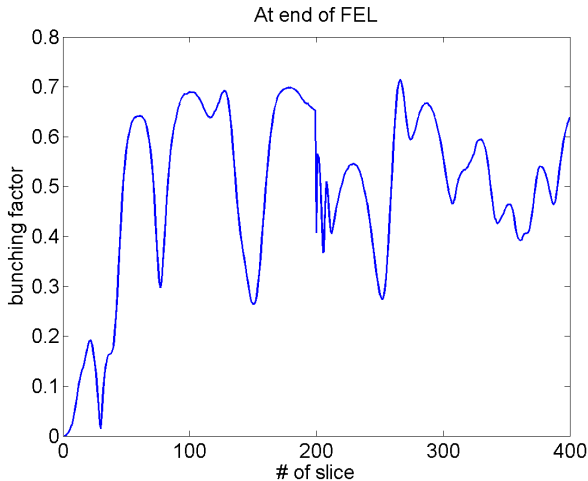
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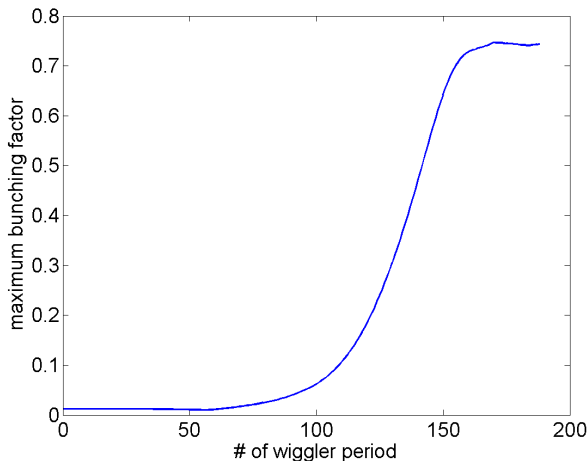
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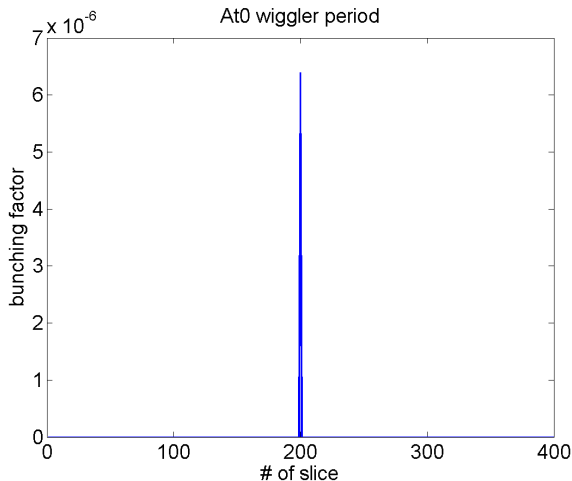
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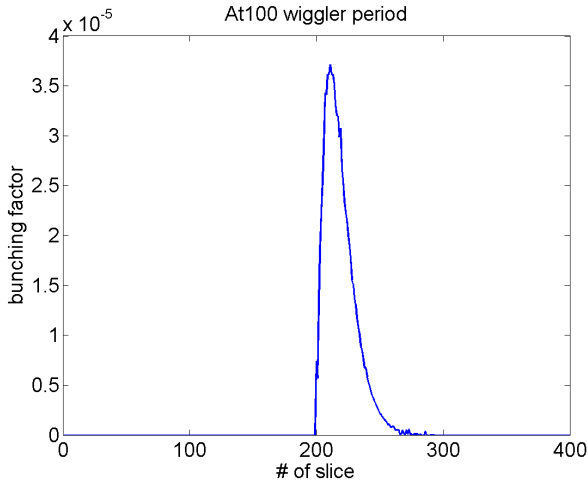
# Bunching factor change along time



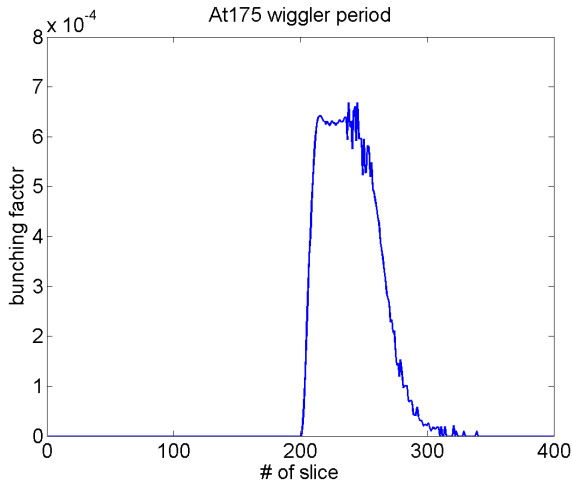
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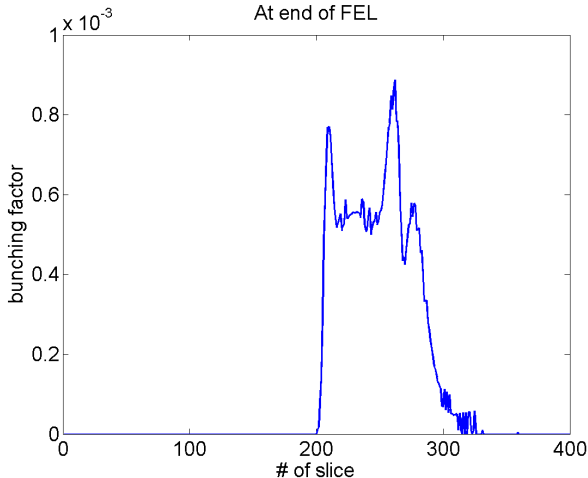
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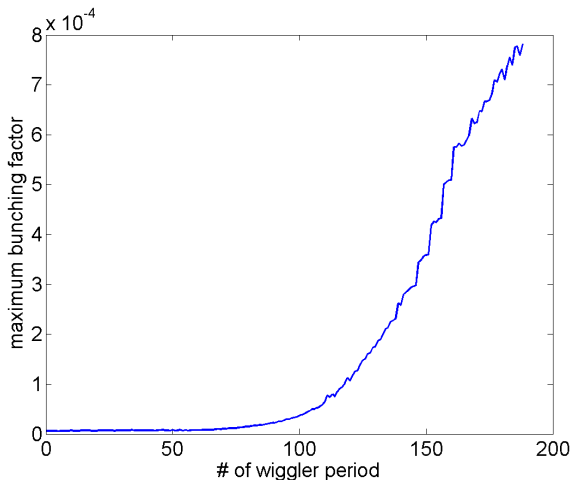
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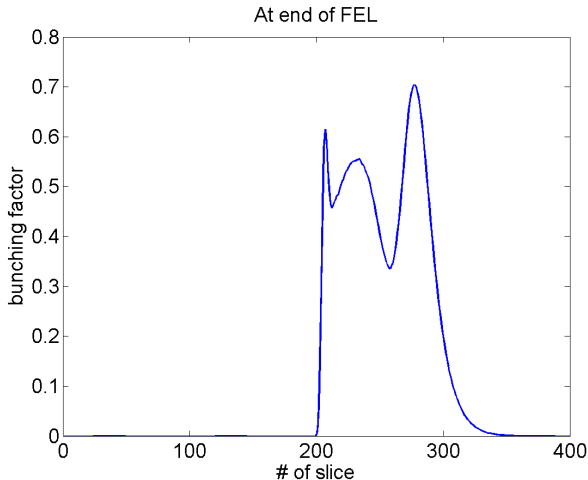
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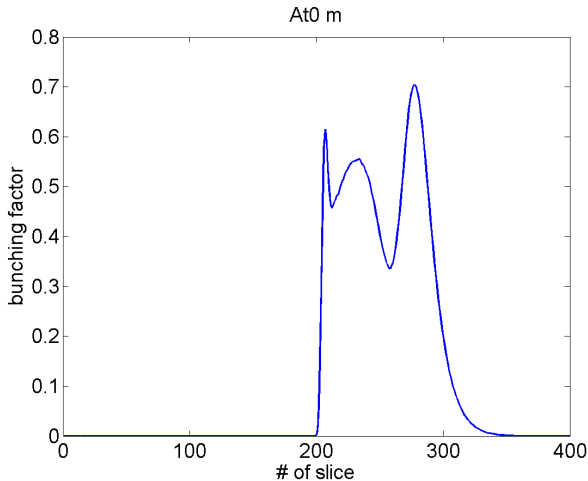
## Bunching factor difference change along time



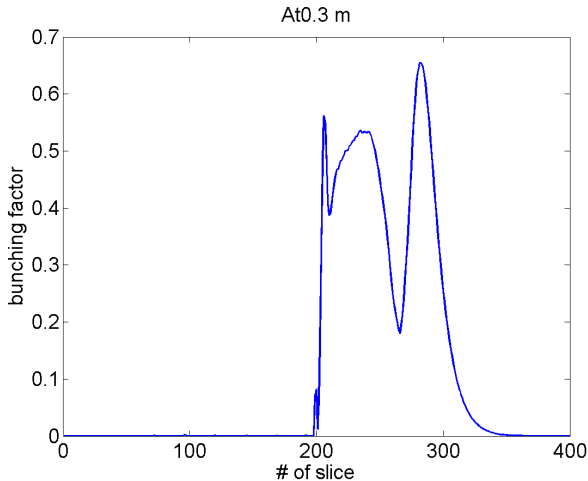
# Final bunching factor in GENESIS



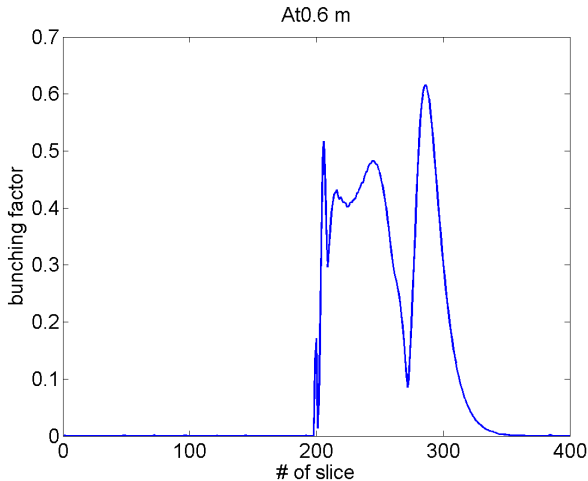
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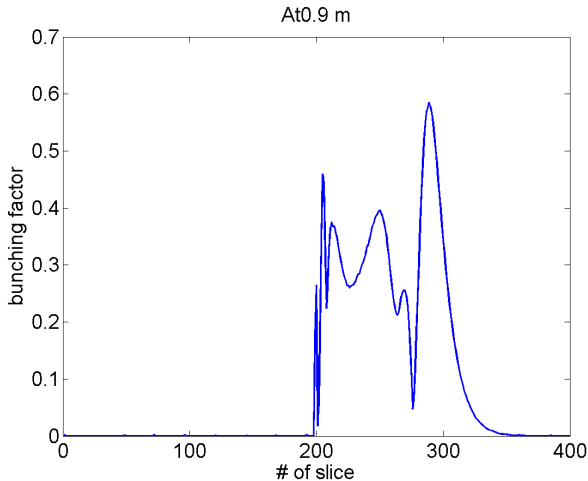
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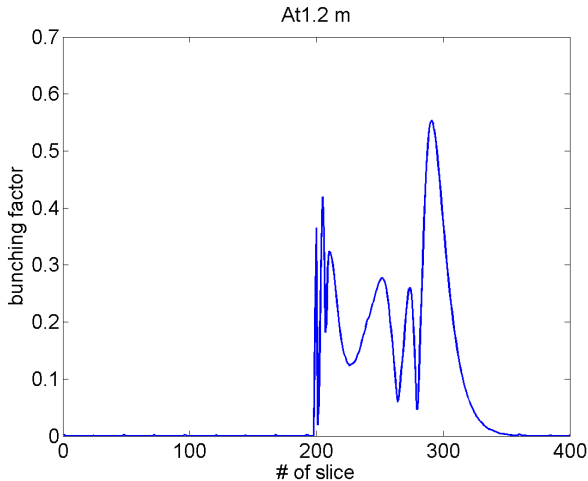
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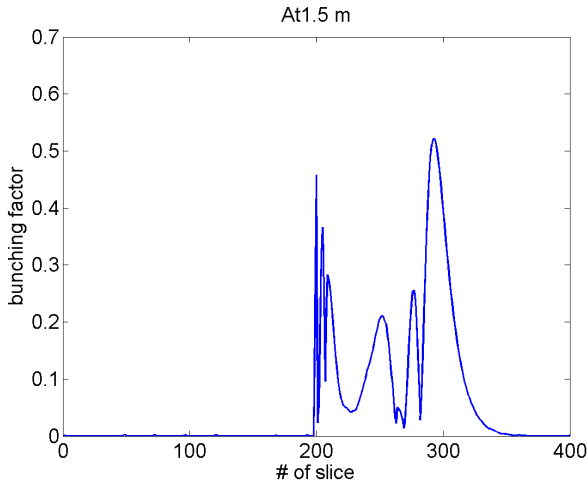
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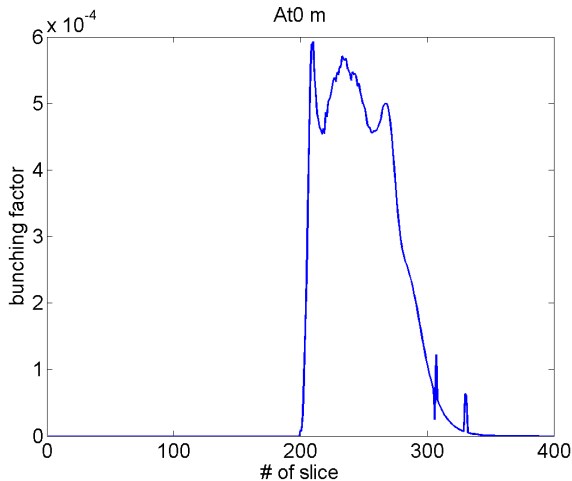
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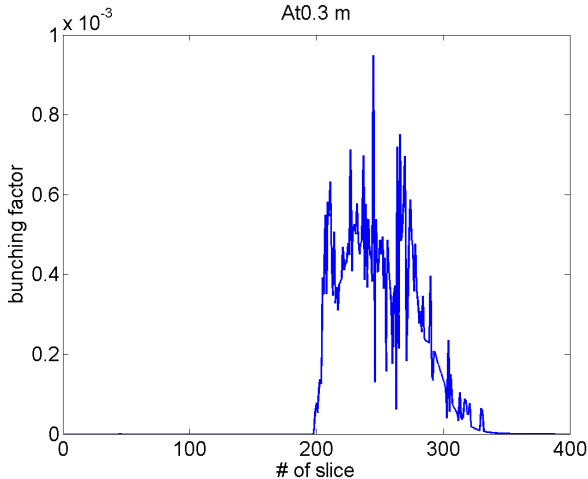
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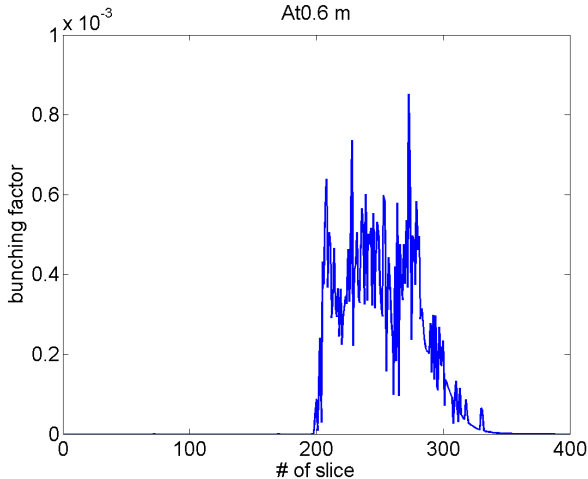
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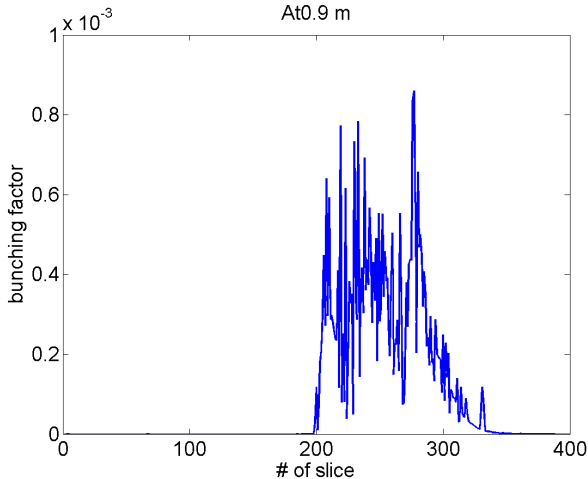
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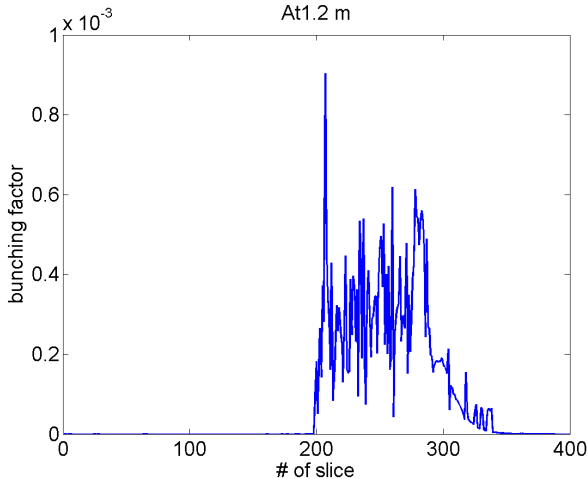
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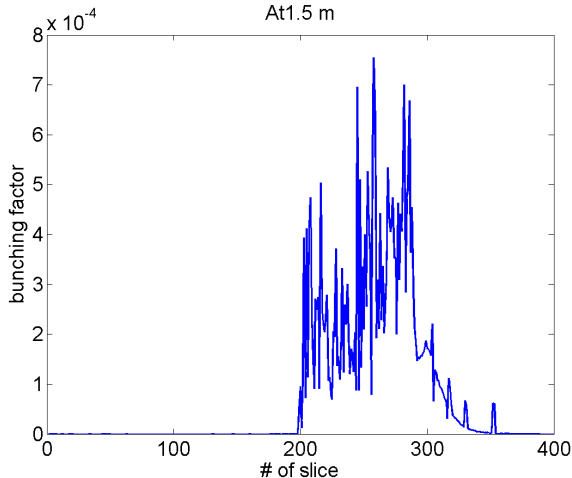
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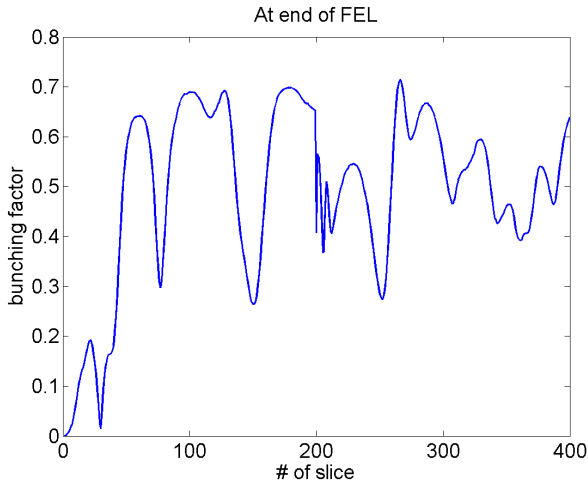
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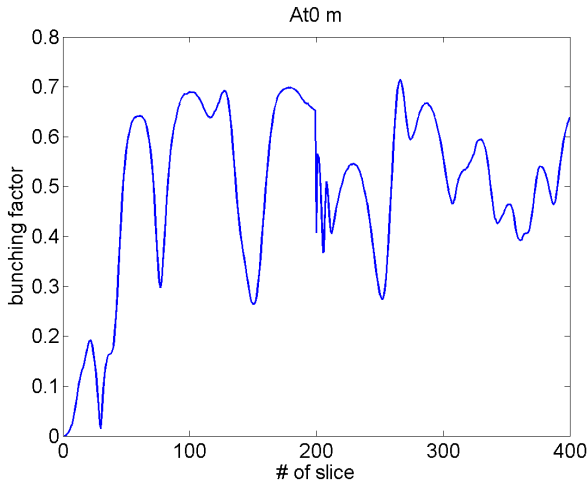
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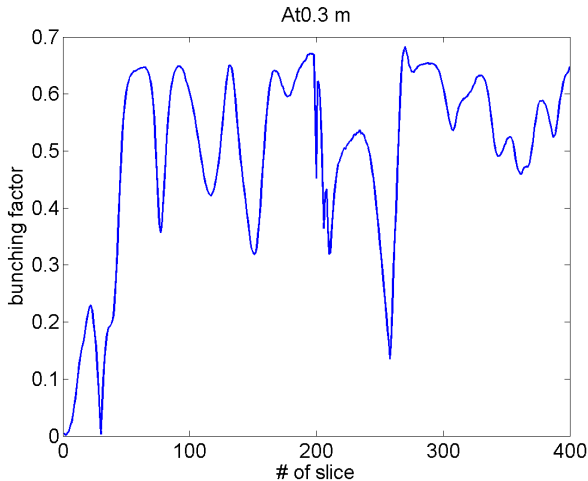
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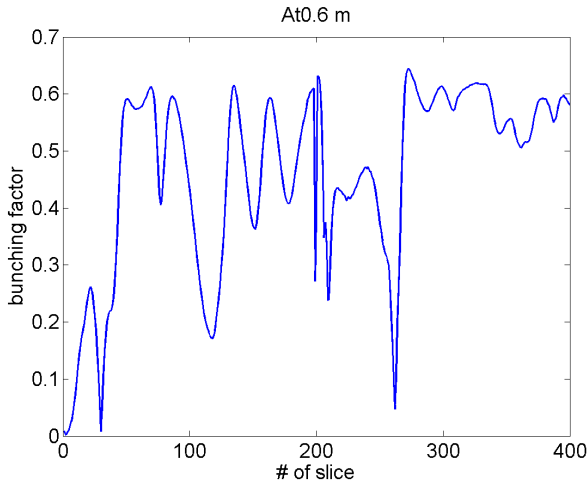
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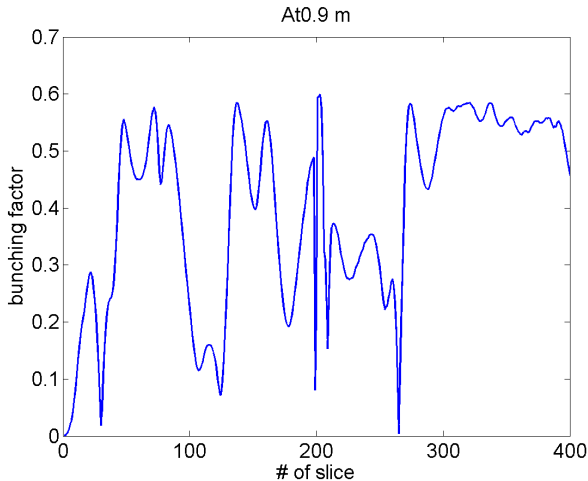
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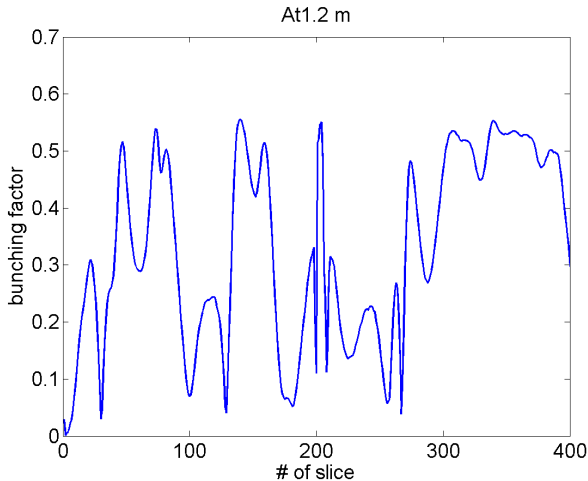
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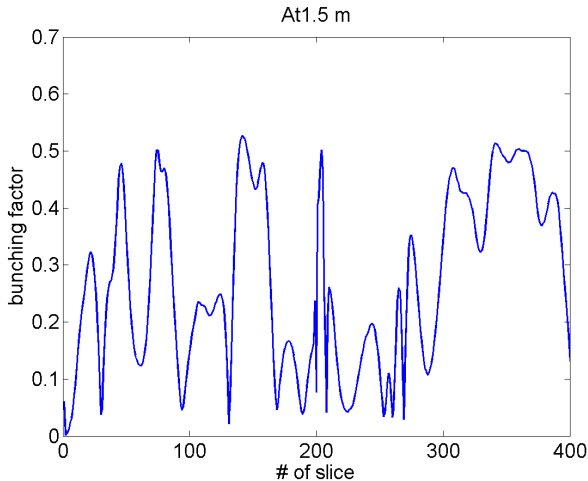
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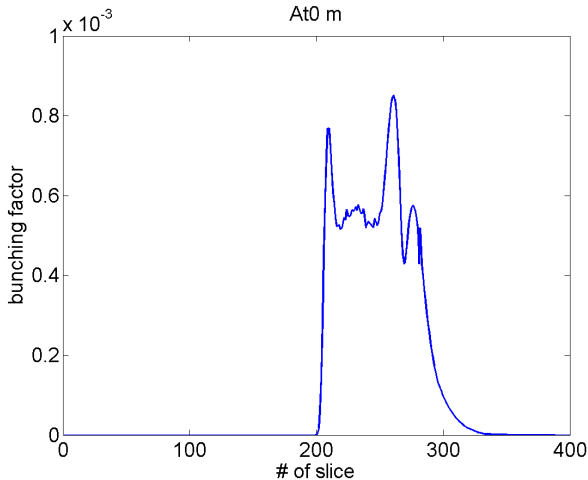
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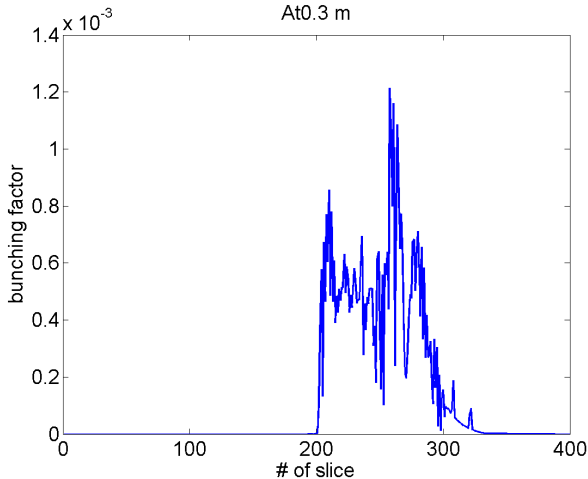
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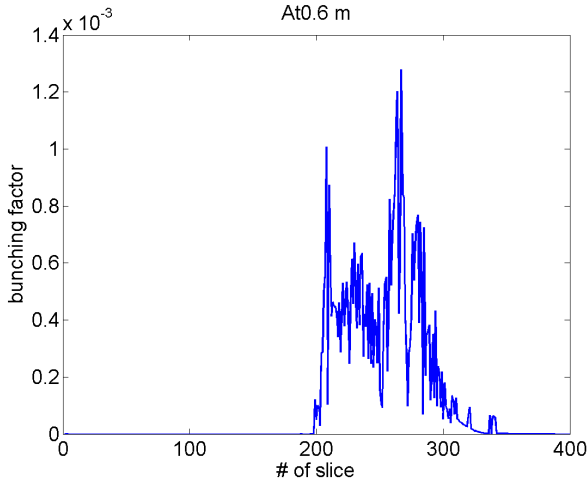
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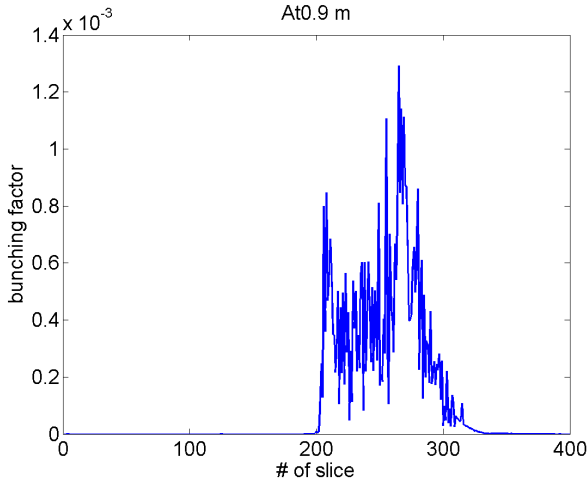
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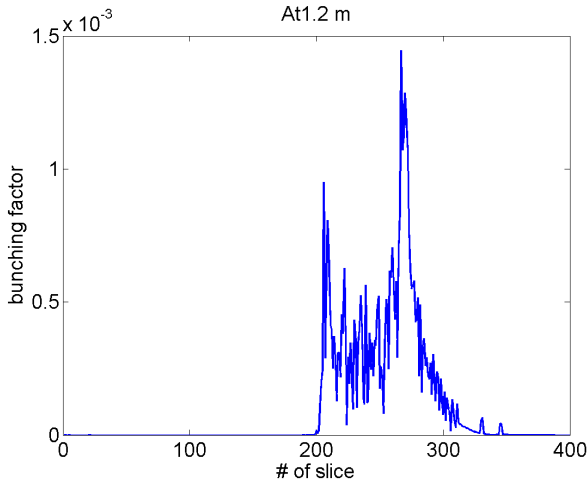
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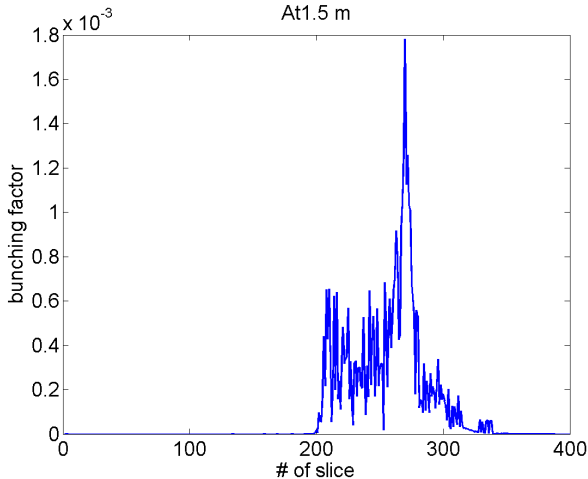
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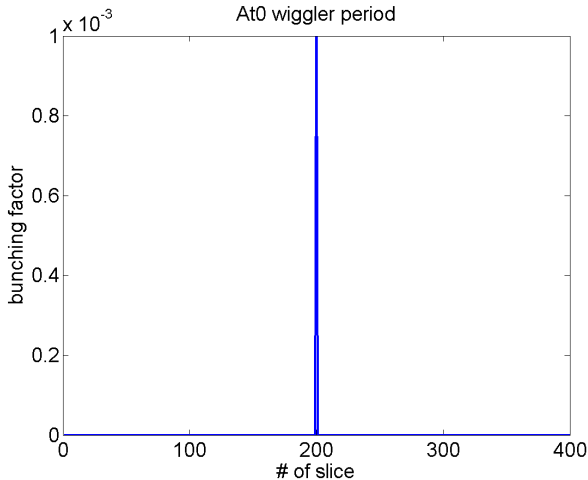
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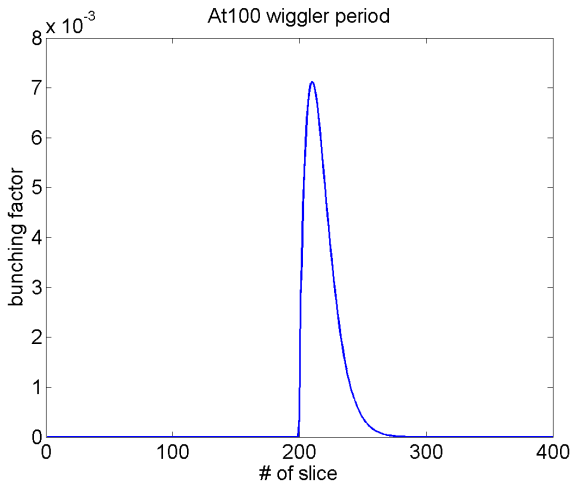
- NBINS : number of bins in the particle phase
- The value has to be at least 4 or larger than  $(2+2n)$

- Give initial bunching factor  $1e-3$  for center slice in GENESIS
- Test with NBINS = 4, 8, 16

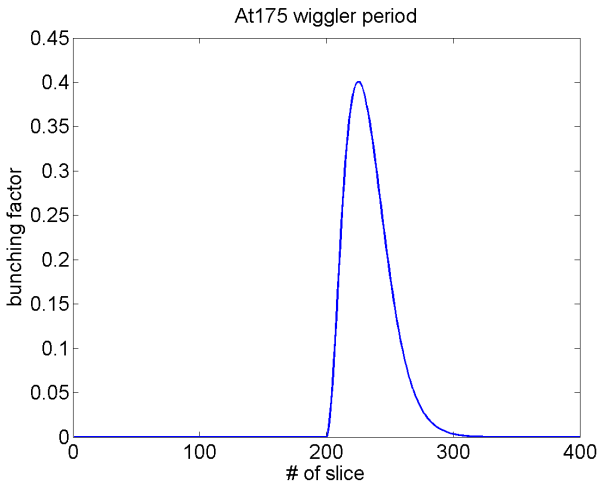
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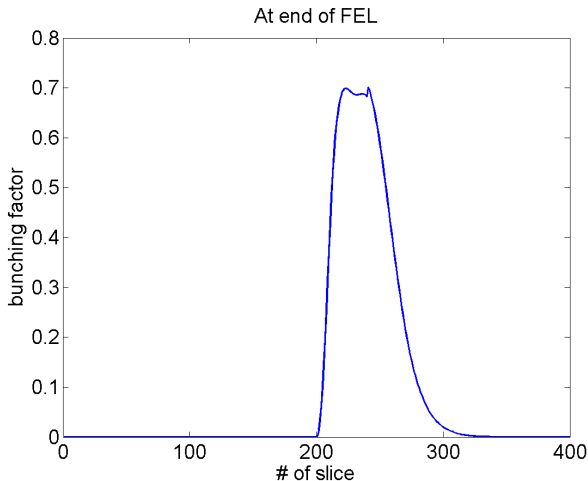
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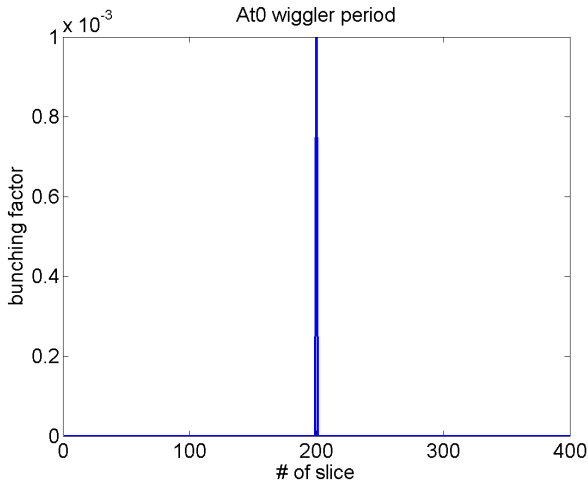
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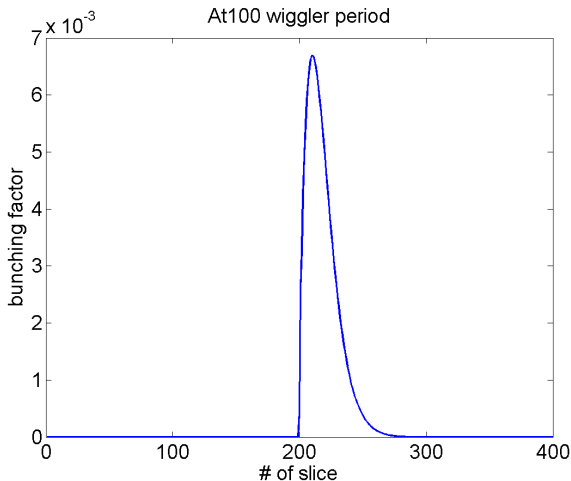
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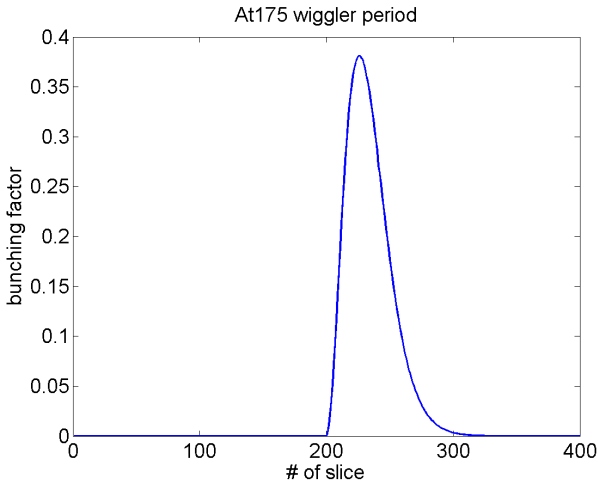
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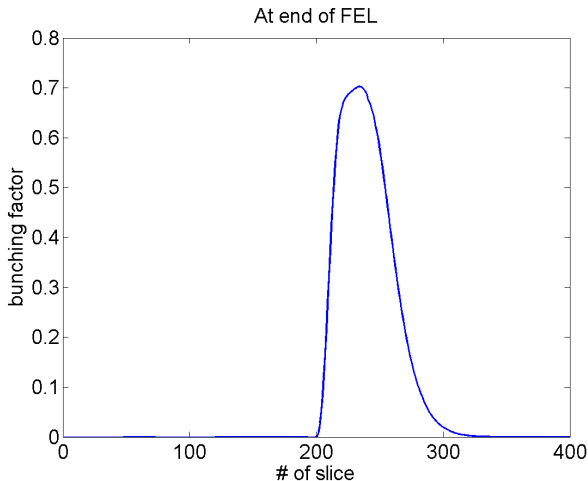
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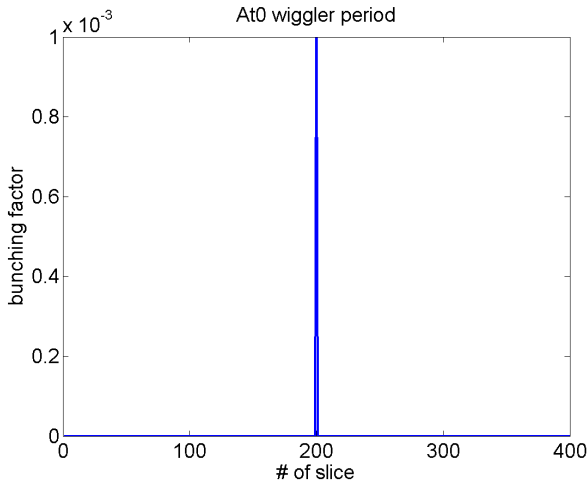
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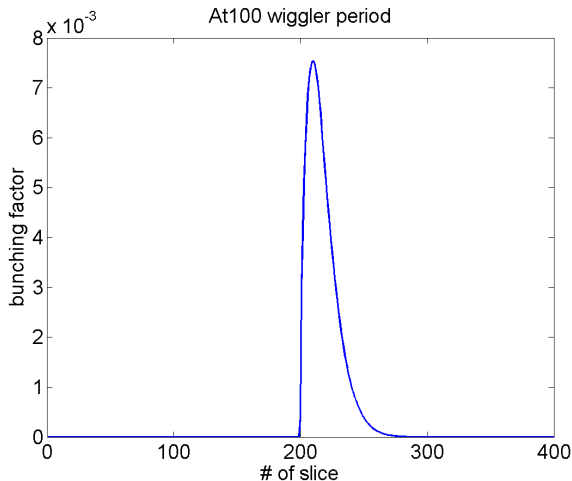
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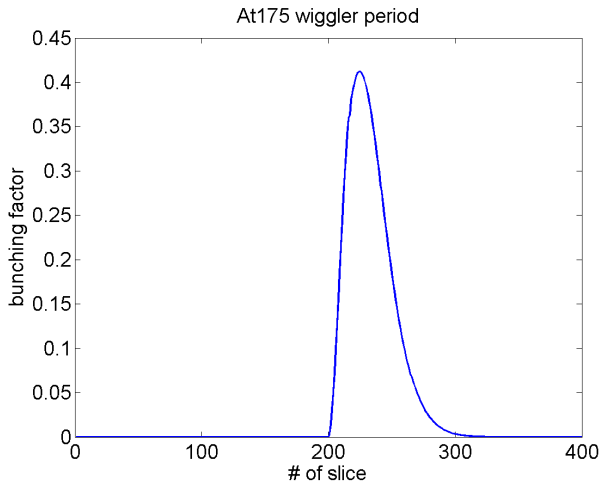
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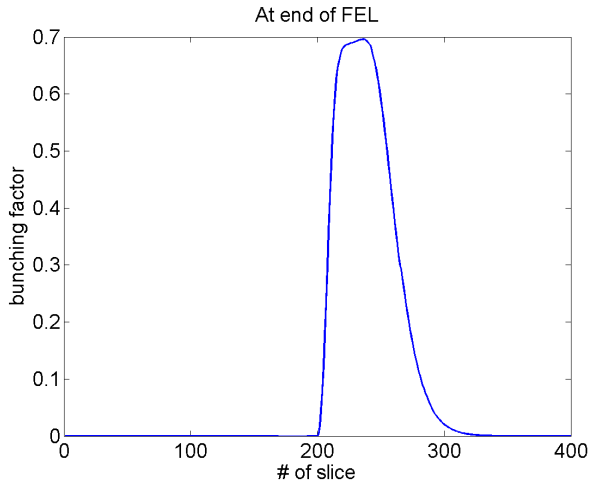
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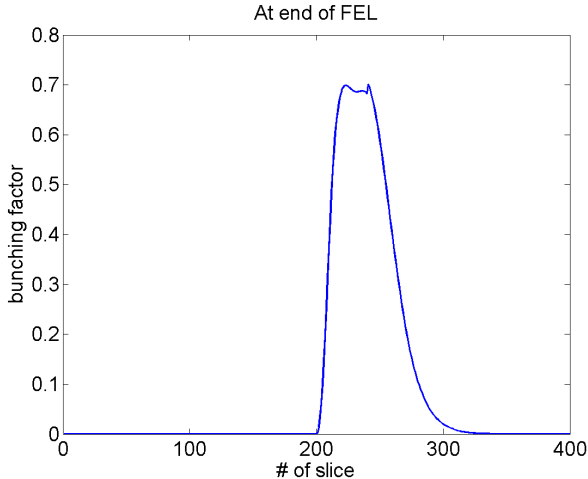
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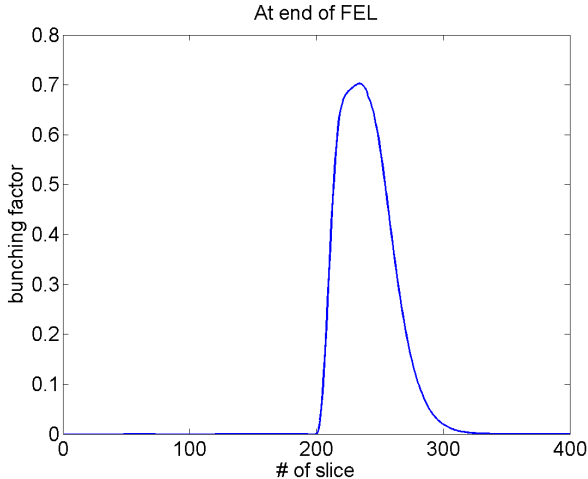
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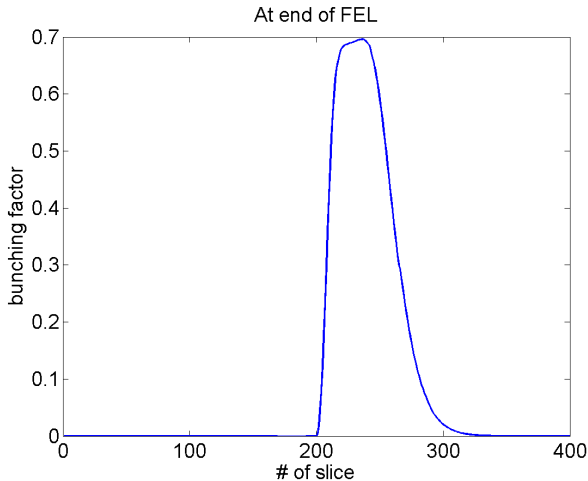
# NBINS = 4



# NBINS = 8

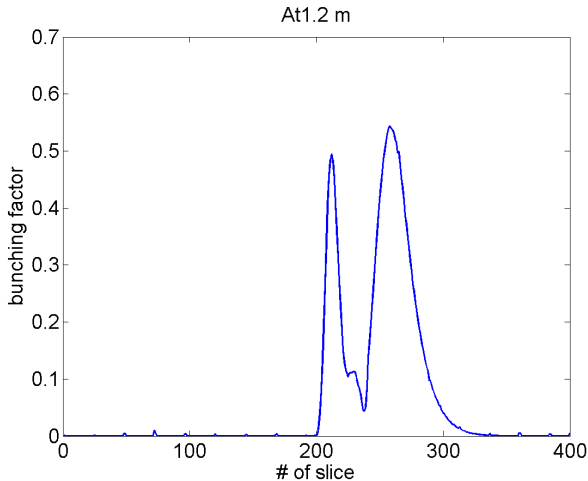


# NBINS = 16

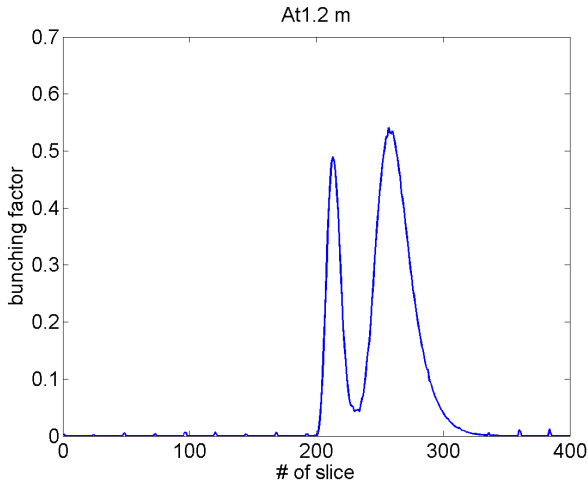


- Give initial bunching factor  $1e-3$  for center slice in GENESIS
- Test with  $NBINS = 4, 8, 16$
- Take the output of GENESIS as the input of kicker

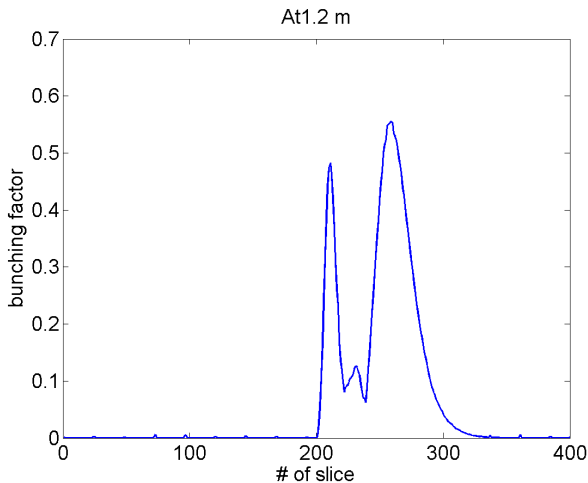
NBINS = 4



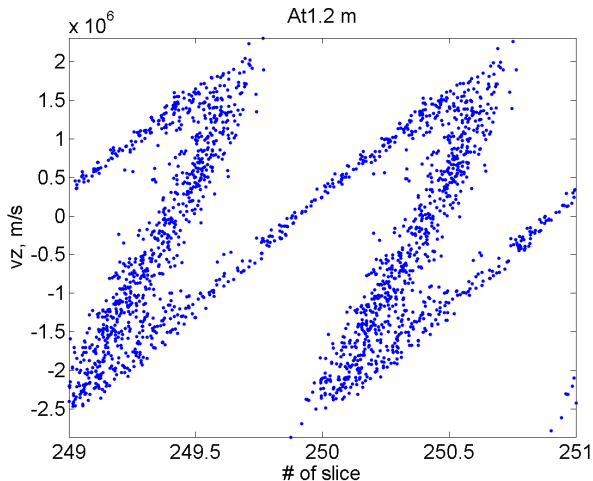
NBINS = 8



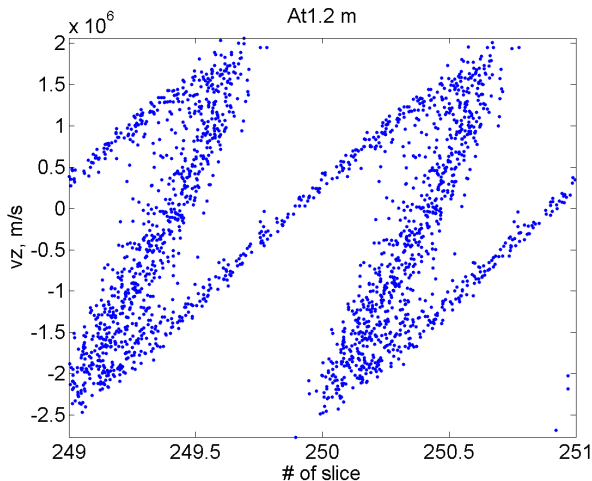
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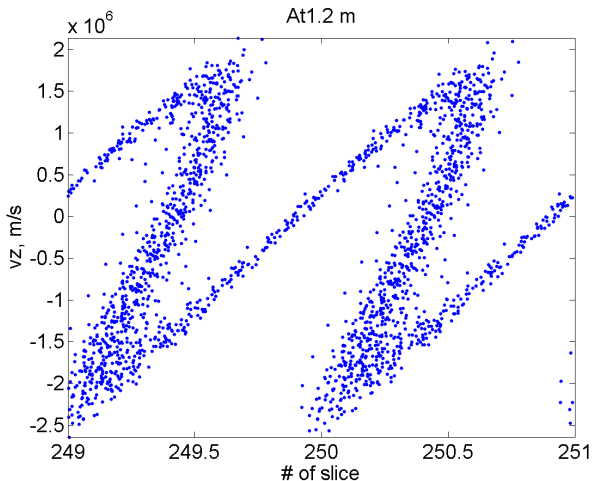
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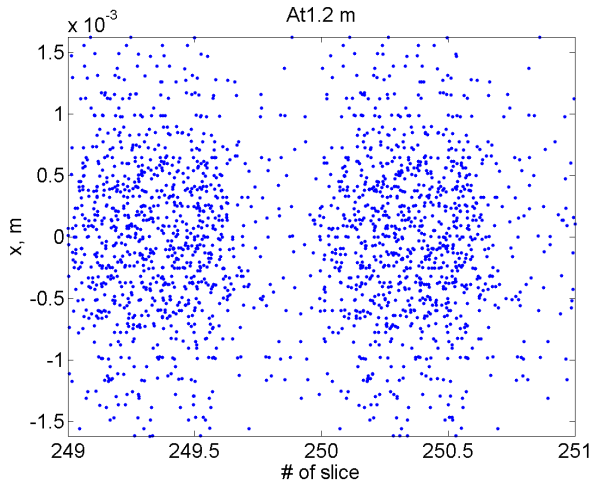
NBINS = 8



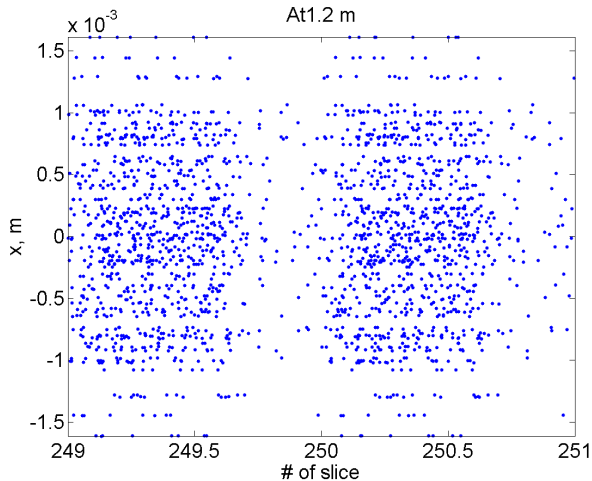
# NBINS = 16



# NBINS = 4



NBINS = 8



NBINS = 16

