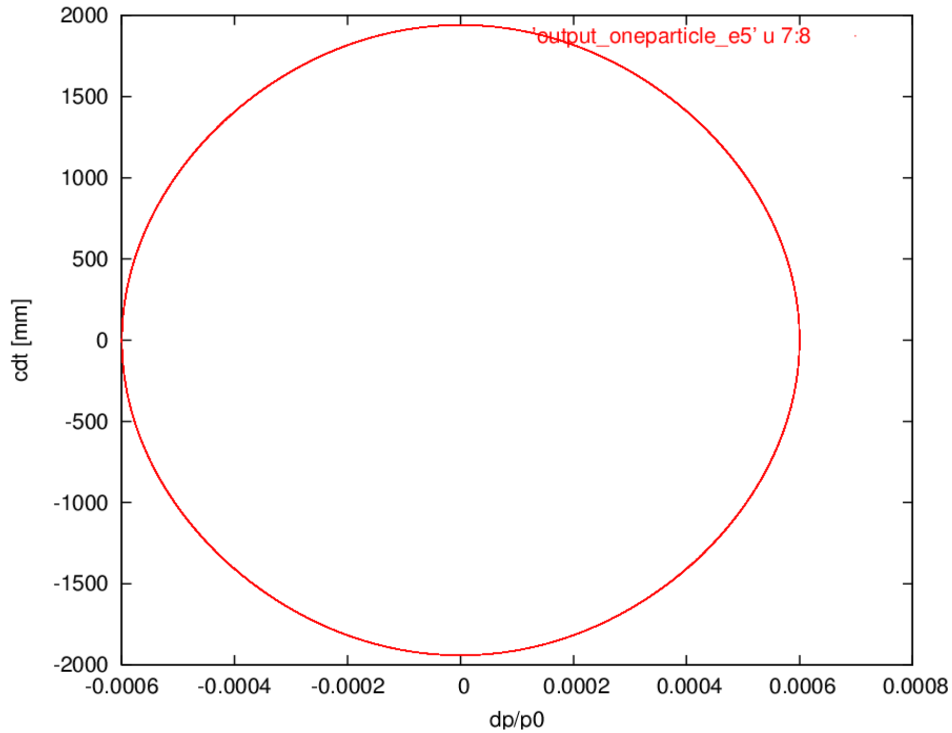
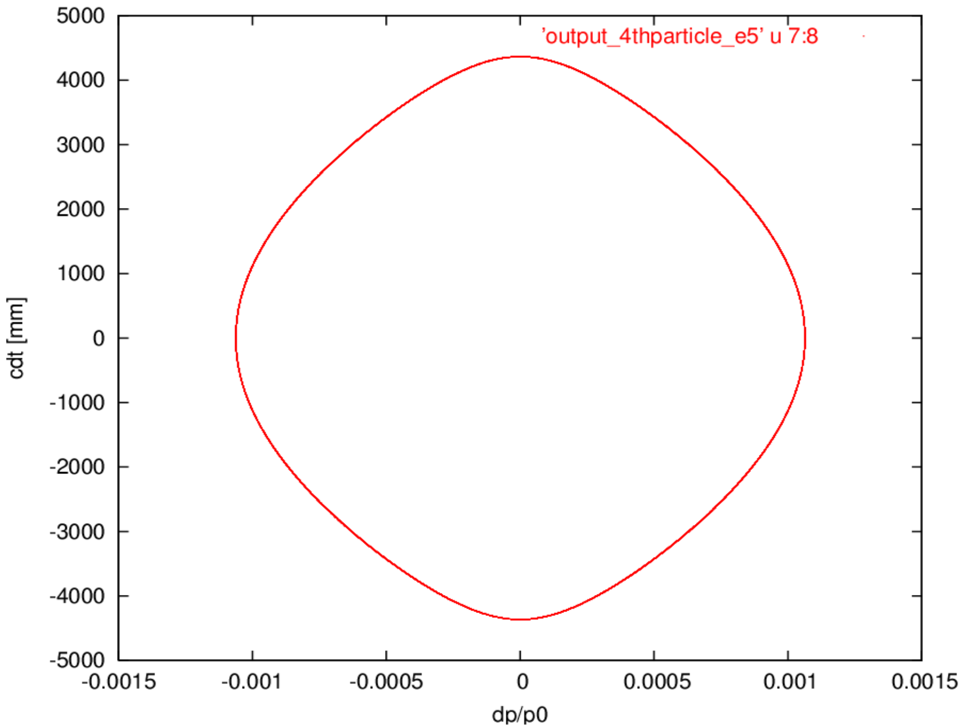
Progress in the multi-particle tracking

Presented by Y. Luo

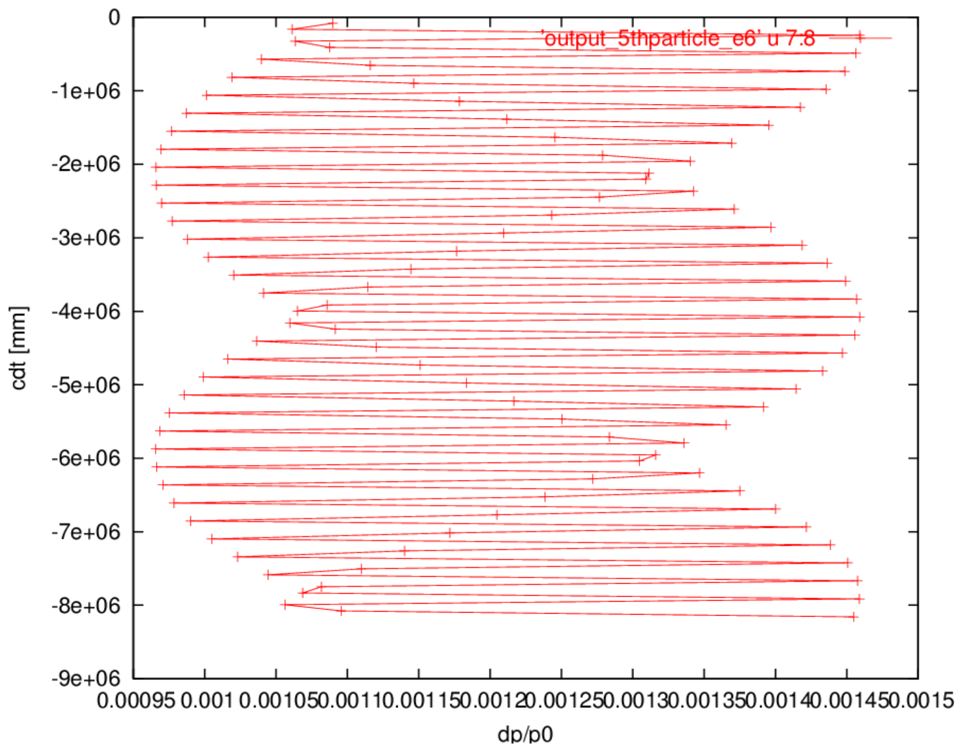
1) Checked the longitudinal motion



delta_{max}=0.0006



delta_{max}=0.001



deltap_{max}>0.001

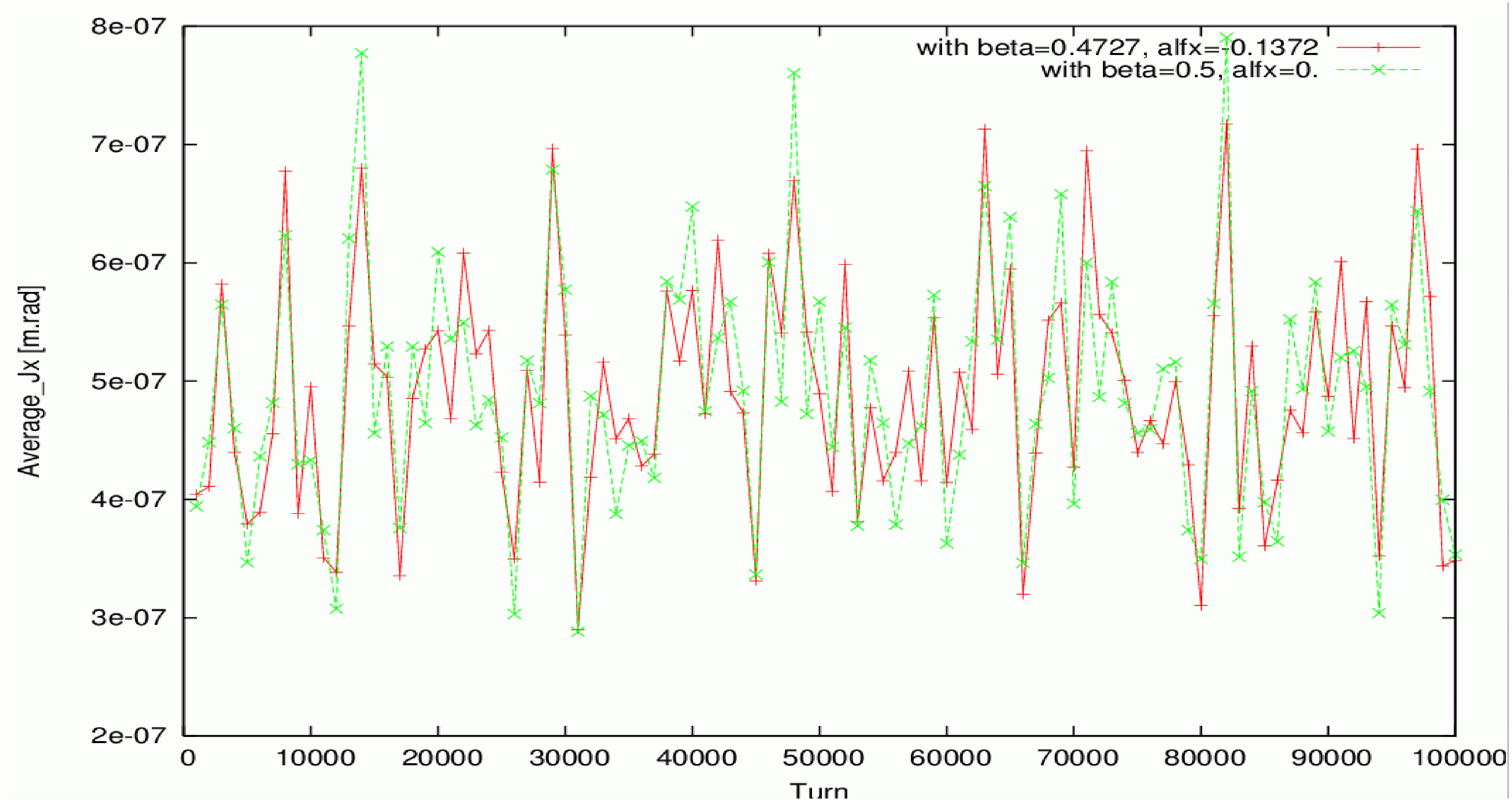
We used:

deltap_{rms}=0.0005, cdt_{rms}=250mm.

In the future tracking, we should use:(checked by Wolfram and Yun)

deltap_{rms}=0.0001, cdt_{rms}=300mm.
Assuming $A(95\%)$= 0.5eV.s, h=360
Vrf=300KV, E=250GeV

2) calculated the average J per turn with 12800 particles(proposed by C. Montag)



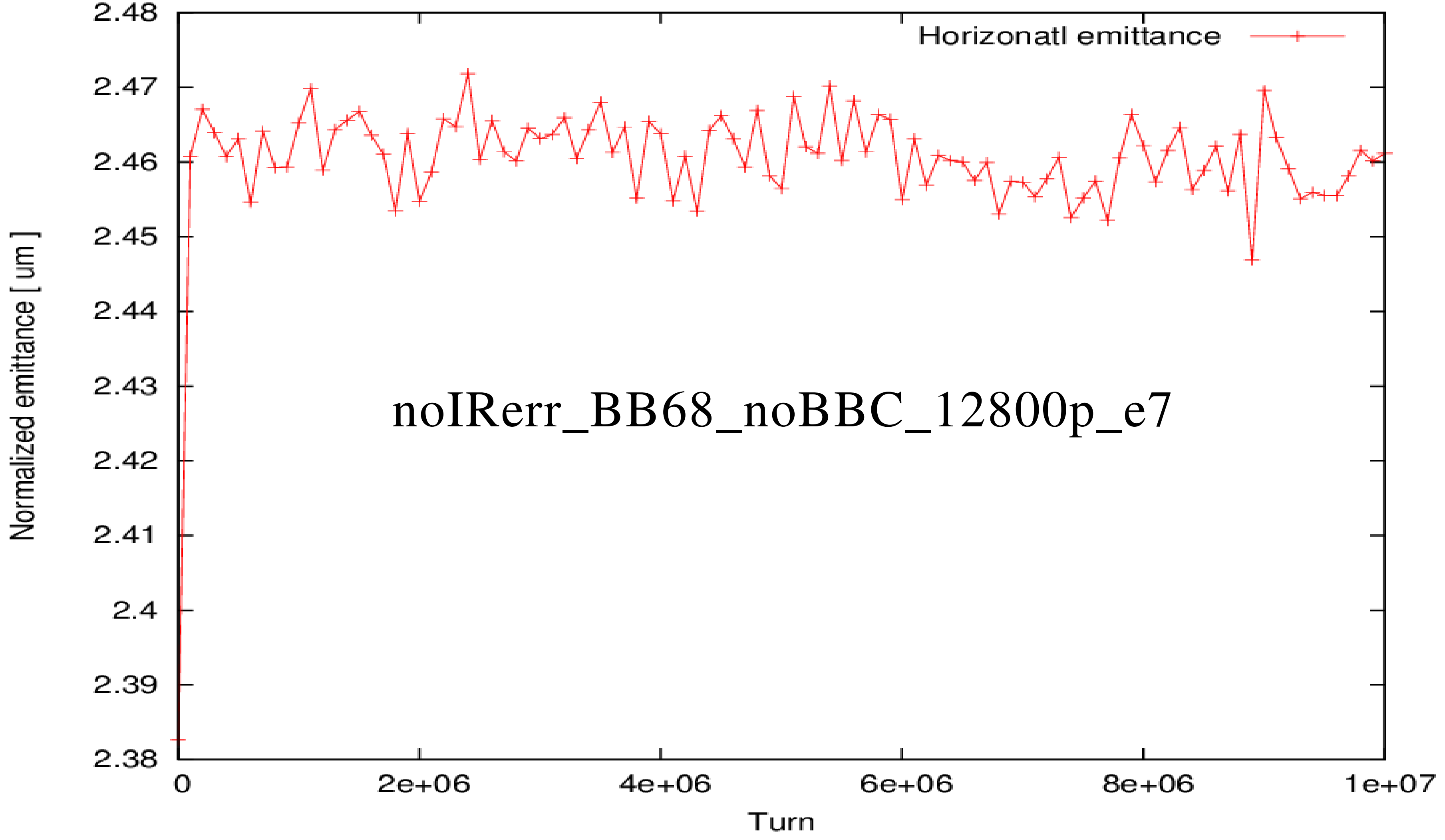
==>0.4727m is beta with BB, 0.5m without BB.

==>larger fluctuations seen with this. Linear assumption is not sufficient here.

==>We still use conventional method to calculate emittance.

3) No good way to produce the perfect Gaussian distribution.

4) 10^7 turn tracking with 12800p is possible here, too. It will take about 3-4 days.



5) One way to reduce the fluctuations in the emittance calculation.

calculate emittance with all coordinates in continuous 100 or 1000 turns.

Then we :

->save coordinates of 12800p every 10~1000 turns

->calculate emittances with 12800p*(100~1000)turns

Problems:

output from sixtrack will be very huge.

<-64p per job

Memory limitation when calculating emittance.

<-don't read in coordinates in memory.

Under testing.

6) Another way to reduce the fluctuation in emittance calculation.

Tracking with weighted macro-particles SINCE particles in the bunch core are more stable, then we have more macro-particles in bunch tail than in the bunch core.

Problems:

->how to generate macro-particles in 6-D

->determine the stable boundary (Natalia)

7) Combining these two approaches will be very great.
But Approach One only may have given us good enough statistics.

8) We are expecting the early coming of the **PRODUCTION**.