

# Preliminary multi-particle tracking results

*Presented by Y. Luo*

1. Using SixTrack to calculate emittance growth in 'BBC'.

The optics tracking: 6-D symplectic  
beam-beam interaction: 4-D weak-strong

2. Multi-particle long-term tracking

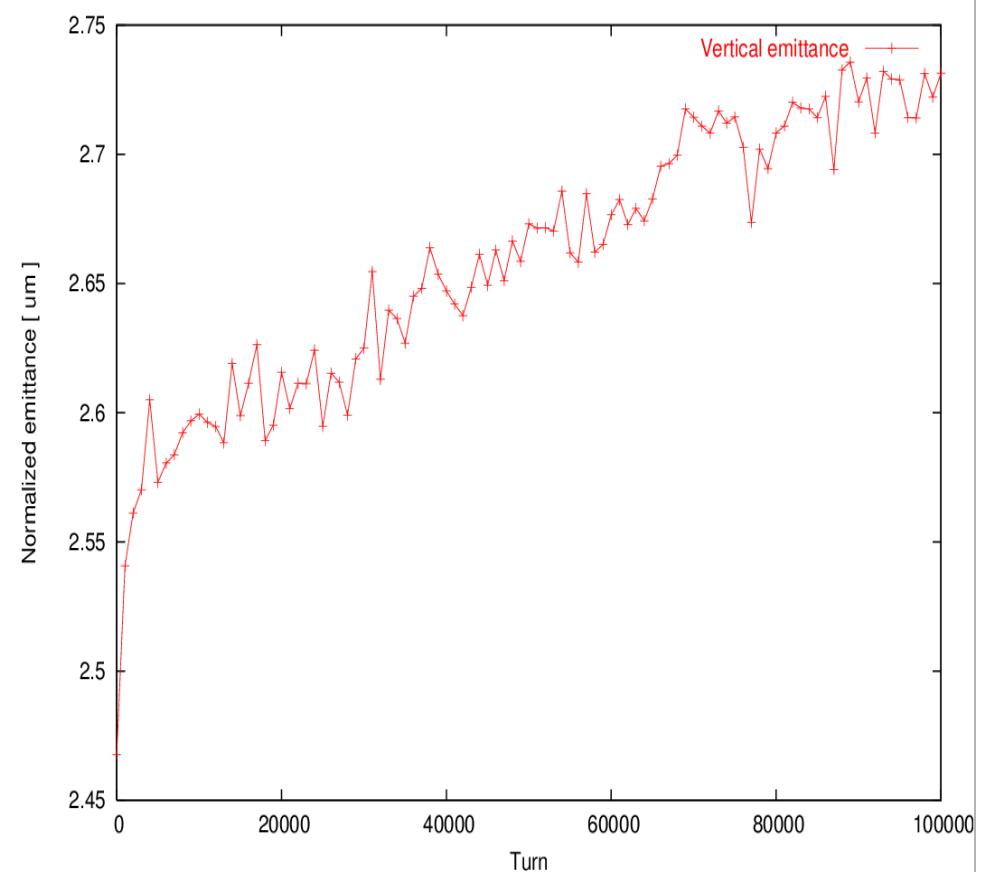
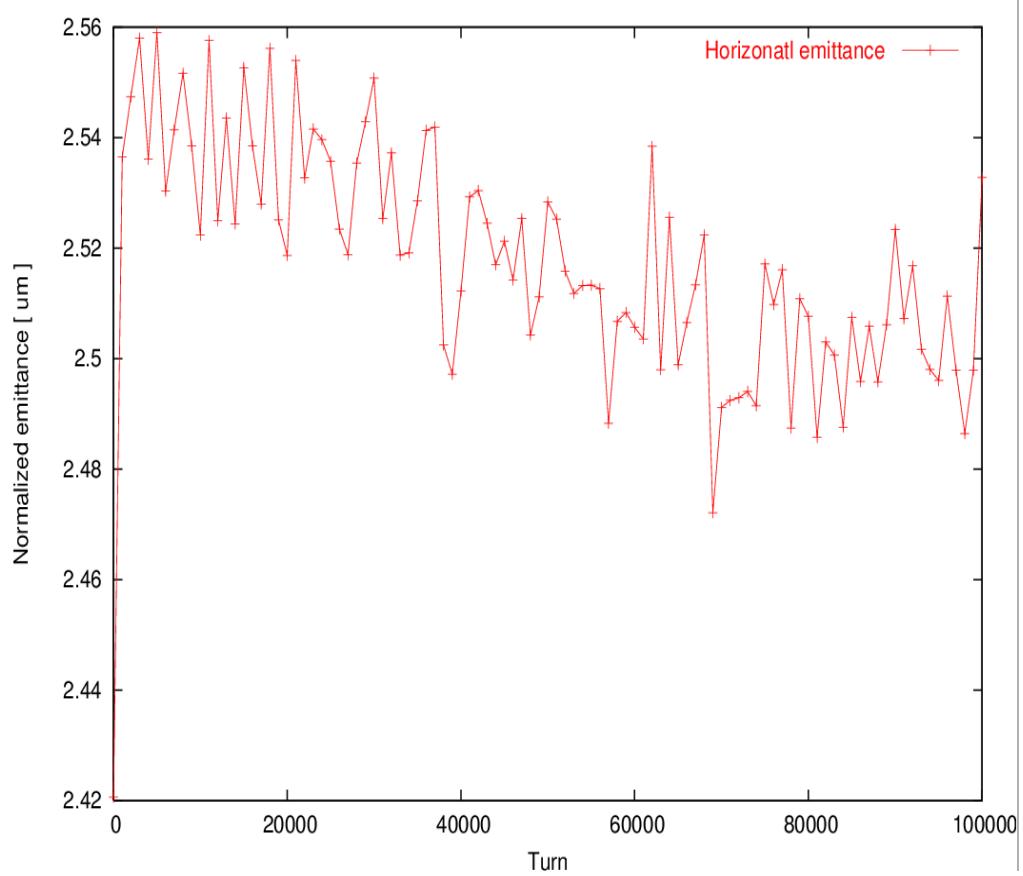
macro-particles: 6400 currently, may need to increase  
turns :  $10^5$  turn for test, normal tracking  $10^6$  turn

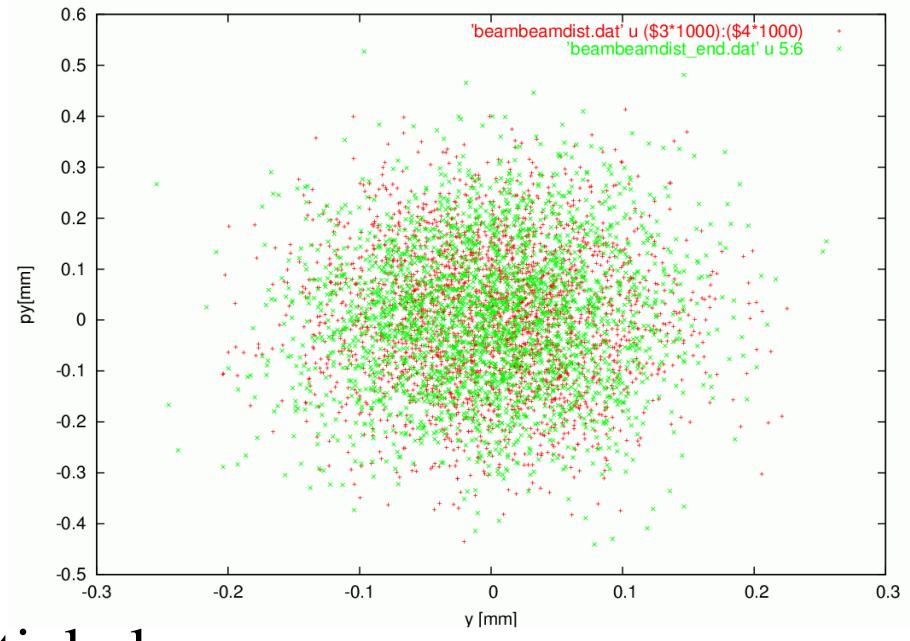
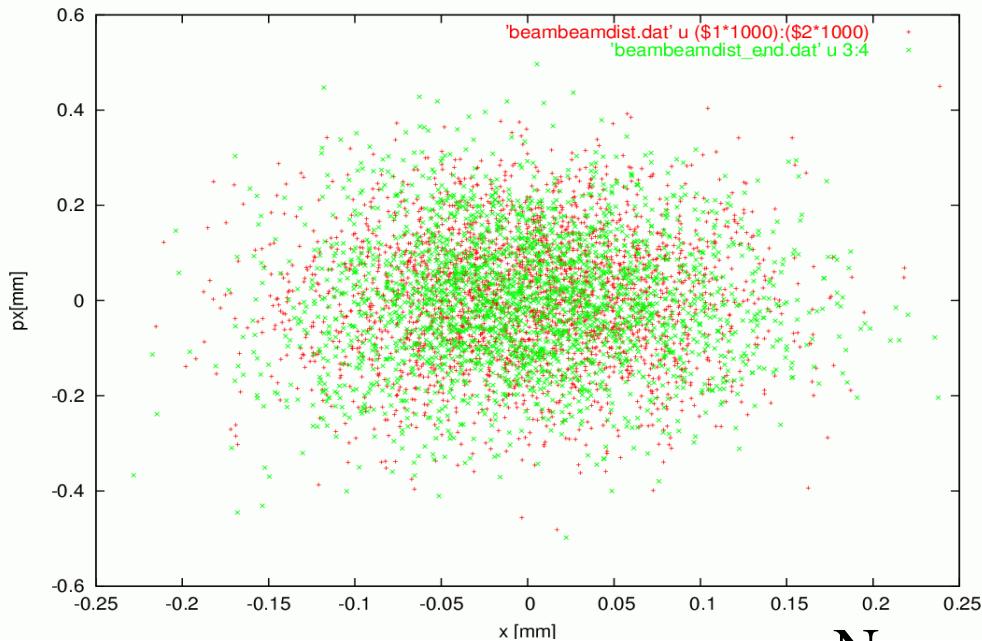
### 3. Tracking without e-lens ( with new version code ):

Not completed yet. Do statistics of 2560 particles.

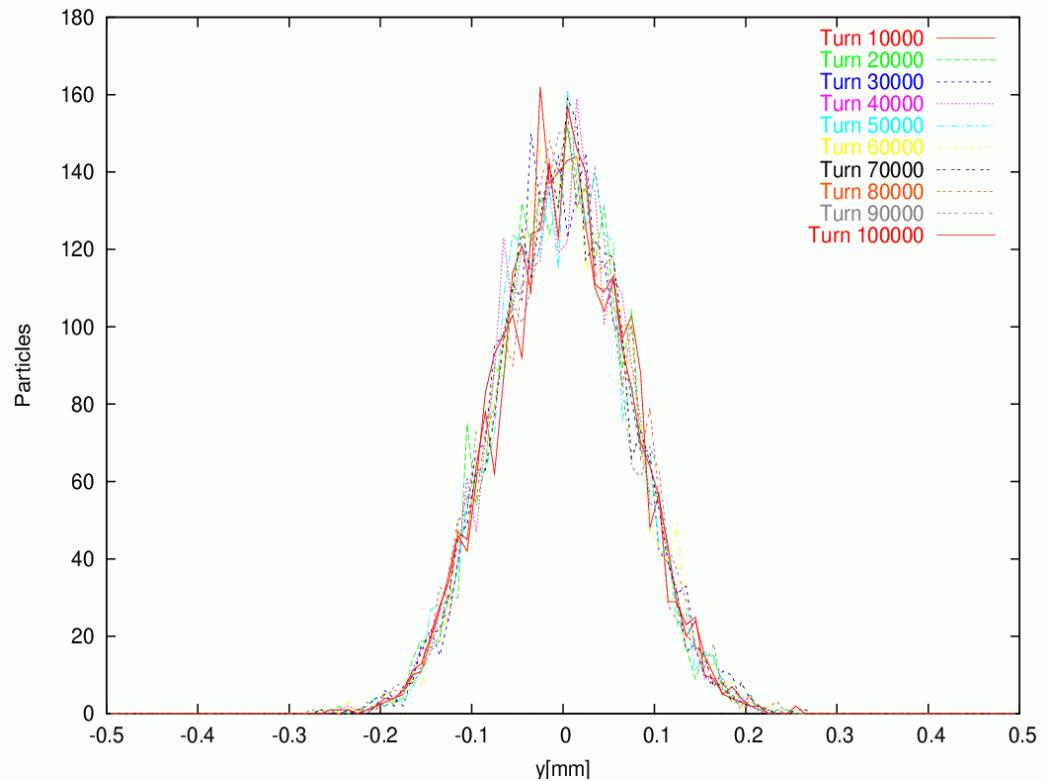
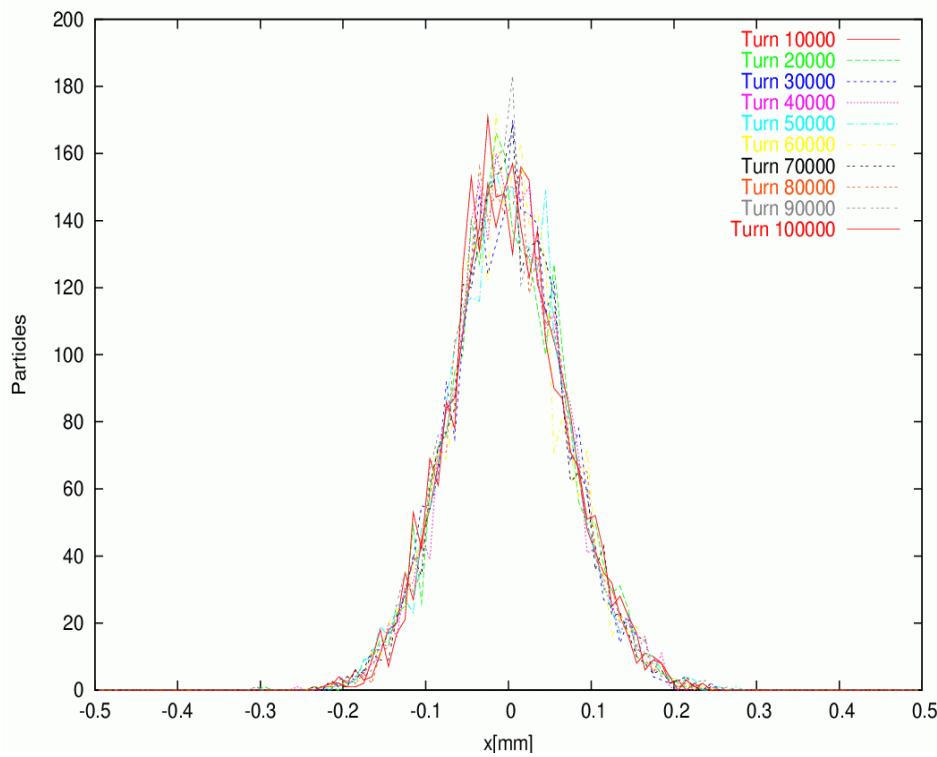
$$Q=(.695, 0.685), Q'=(1,1)$$

$N_p=2.0e11$ , BB at IP6/8,  $\beta^*=0.5m$ ,  $10^5$  turns





## No particle loss

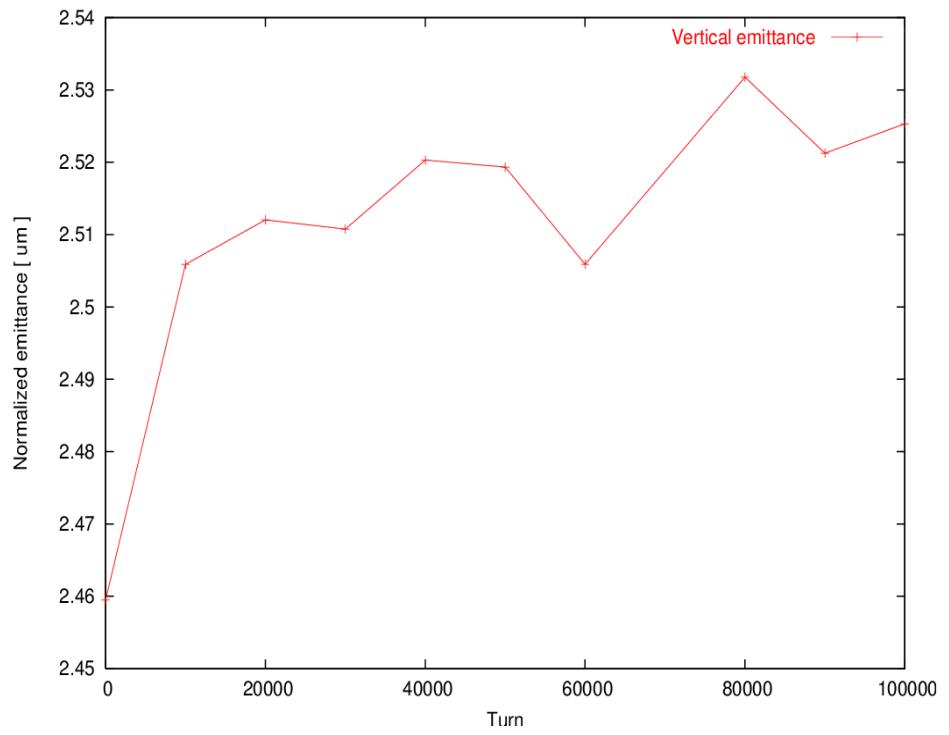
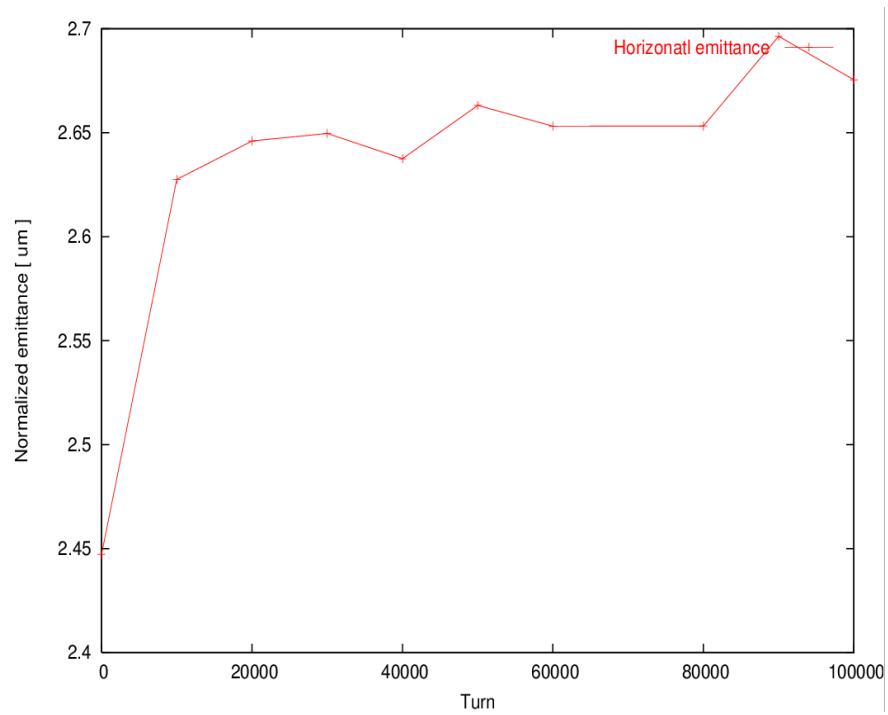


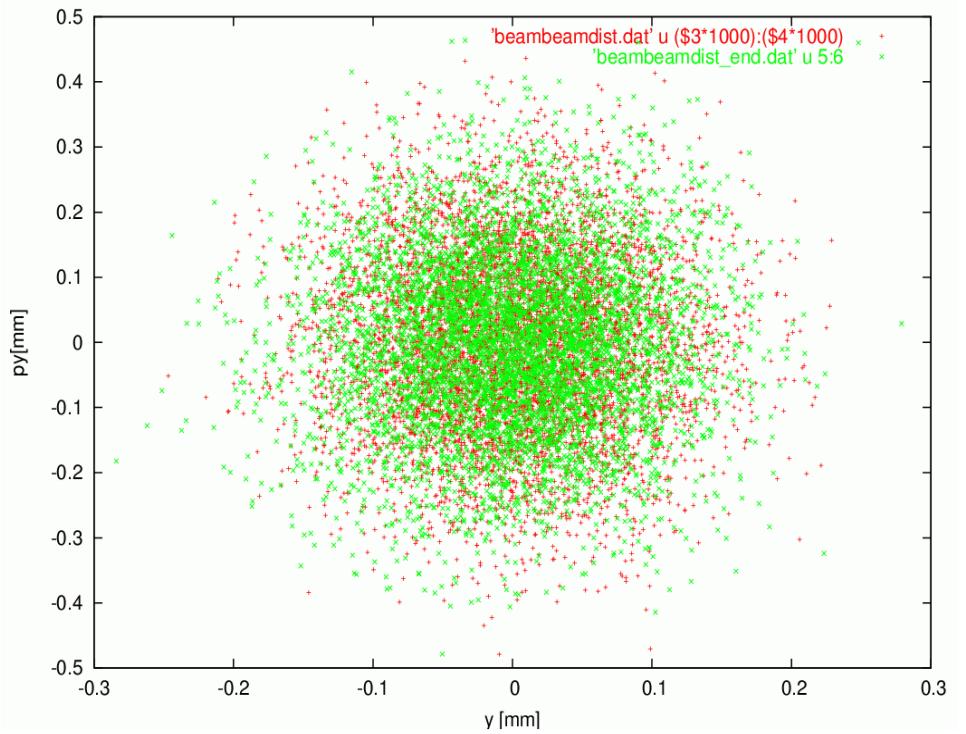
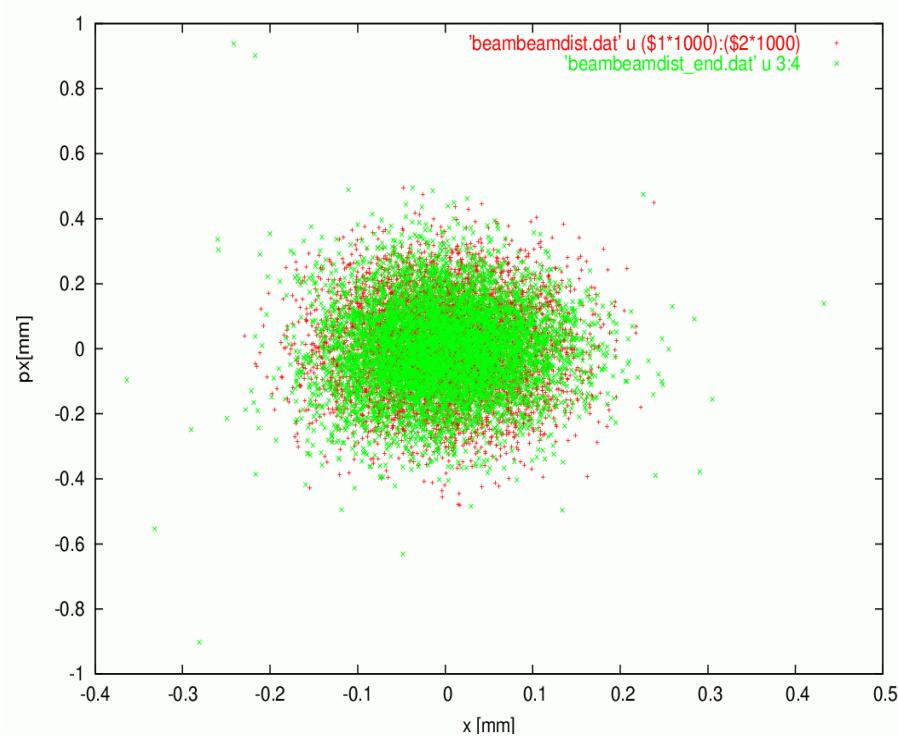
#### 4. Tracking with e-lens ( with older version code)

Tracking stopped. Do statistics of whatever we had.

$$Q=(.695, 0.685), Q'=(1,1)$$

$N_p=2.0e11$ , BB at IP6/8,  $\beta^*=0.5m$ ,  $10^5$  turns





New version doesn't save the coordinates of the last particles.

## 5. Questions to the 'tracking results'

1) why initial emittance not exactly 2.5 pi.um

numeric-recipe can't generate initail coordinates with 6400 particles with good statistics.

2) Why emittance curve not smooth during the tracking ?

Increase the observation turns ( 100 steps ), still there one reason : 6400 particles not enough.

3) Particle loss in the old version

if seen, should check. They are large amplitude particles from beginning?