APEX on Benchmarking Longitudinal IBS at 40 GeV

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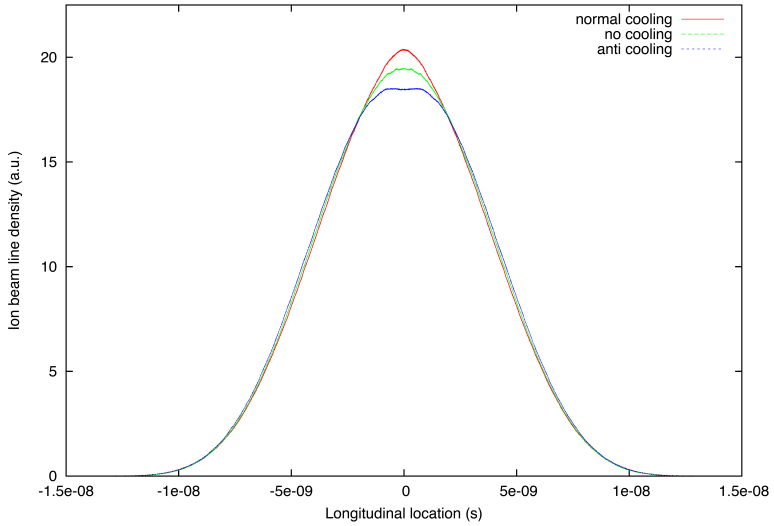
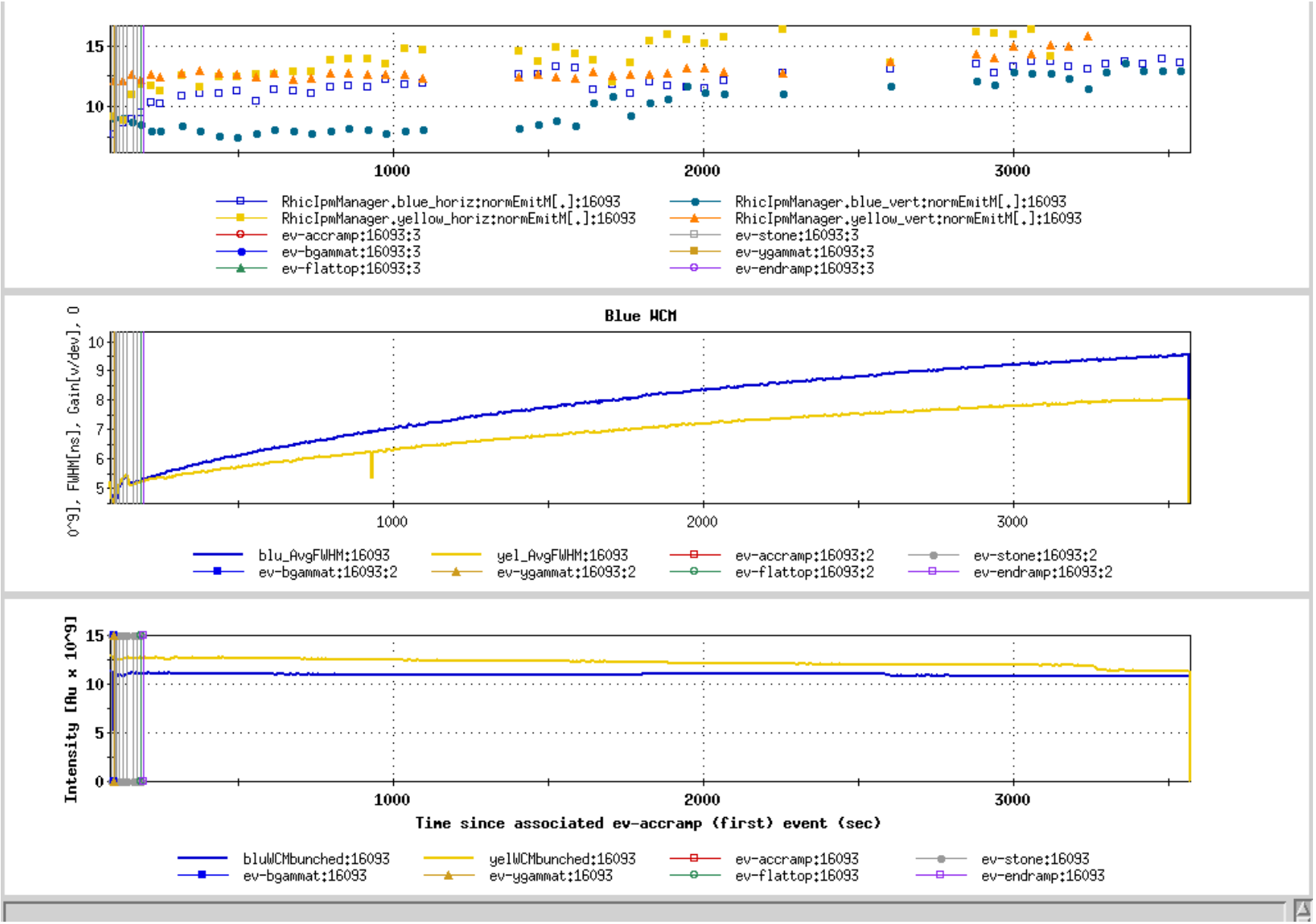
Intention

- Due to its relative fast growth rate (~40 minutes), longitudinal IBS plays important role in the proof of CeC principal experiment.
- At this APEX, we made the beam sit at 40 GeV store for ~30 minutes in order to get a clean measurement of the bunch length due to longitudinal IBS.
- The measurement will help in benchmarking the IBS algorithm applied in CeC simulation and hence improve the accuracy of the code.

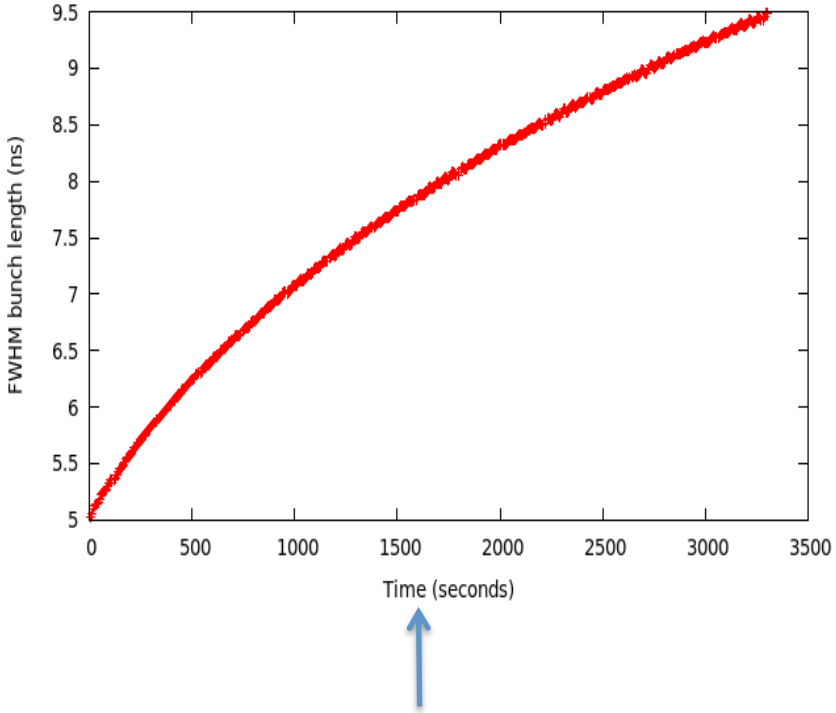
1.6e8 Au bunch intensity
1 nC electron bunch charge
102 seconds of cooling



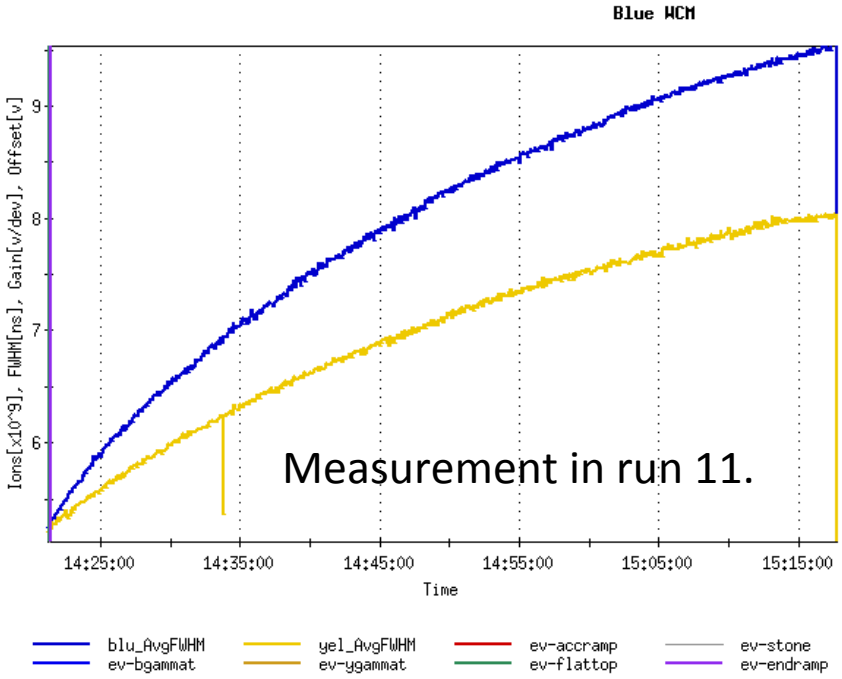
Measurement at 40 GeV, run 11



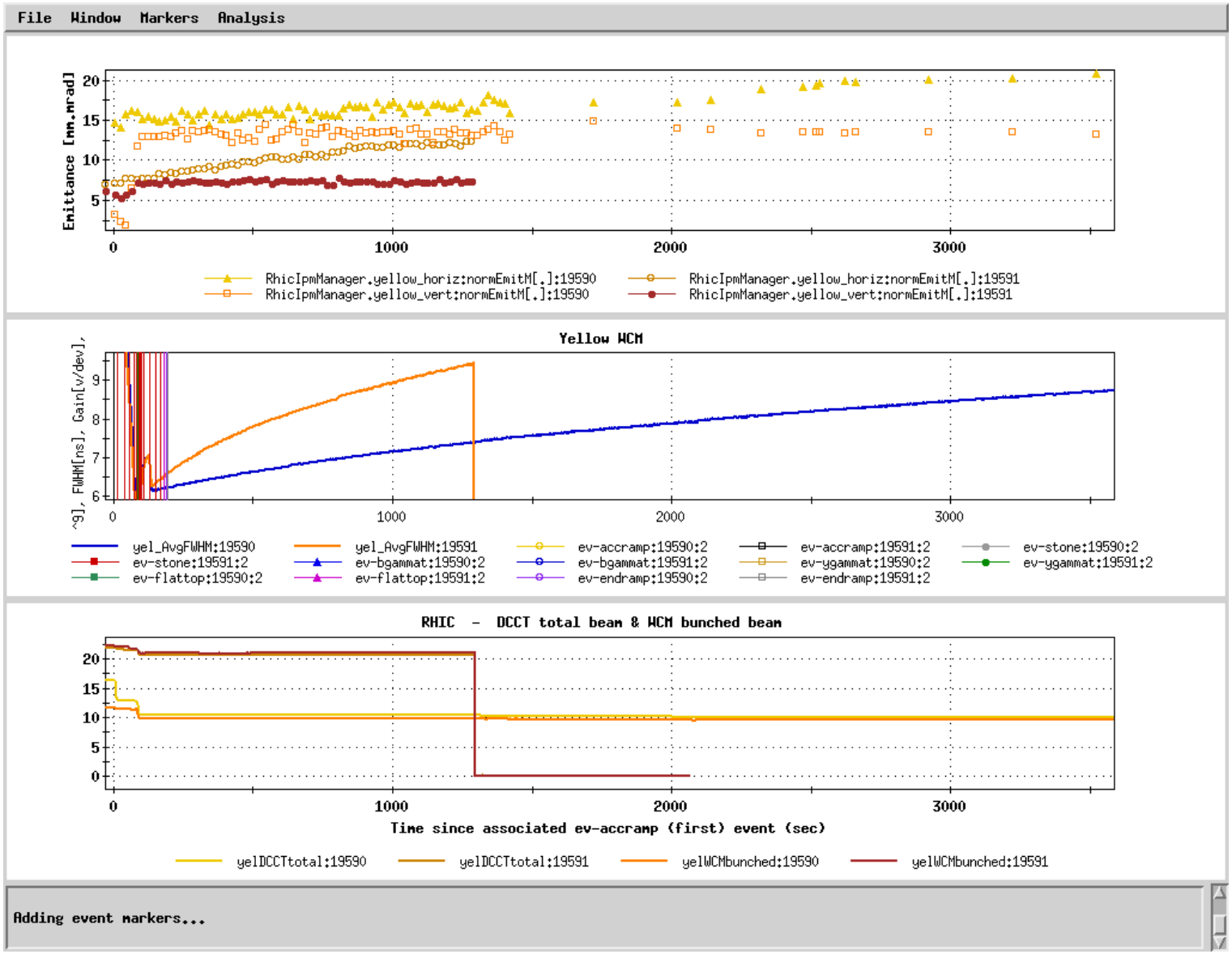
The output of current IBS subroutine



Output of current IBS subroutine (taken from Mike's stochastic cooling code), which is based on Piwinski's formula.
bunch intensity: 1E9
emittance: 15 pi mm.mrad



Measurement at 40 GeV, run 16



Summary

- New data on bunch length growth at 40 GeV were collected during the last APEX, which will be used to benchmark the IBS subroutine of the simulation code for CeC PoP.
- The data analysis is underway.