a) Tracking performance:

- Document the assumption on the simulation model that has been used, such as physics processes and detector simulations besides hand-calculations.

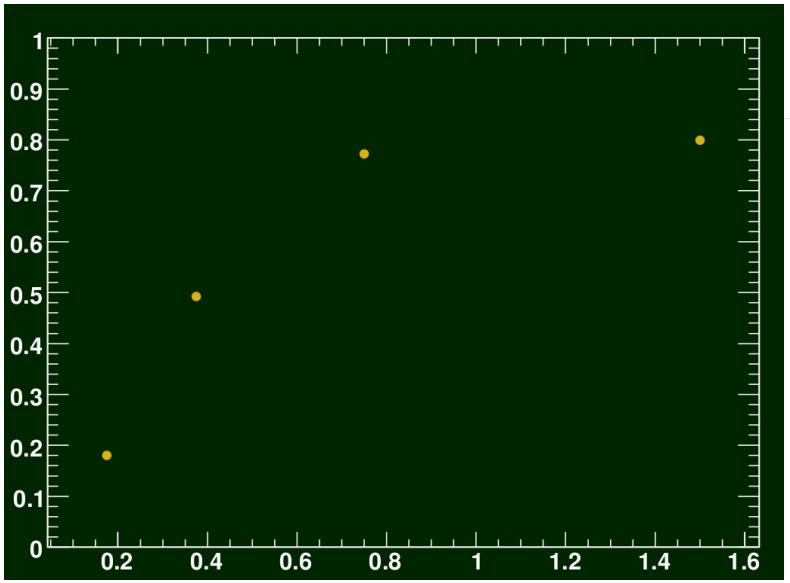
???

a) Tracking performance:

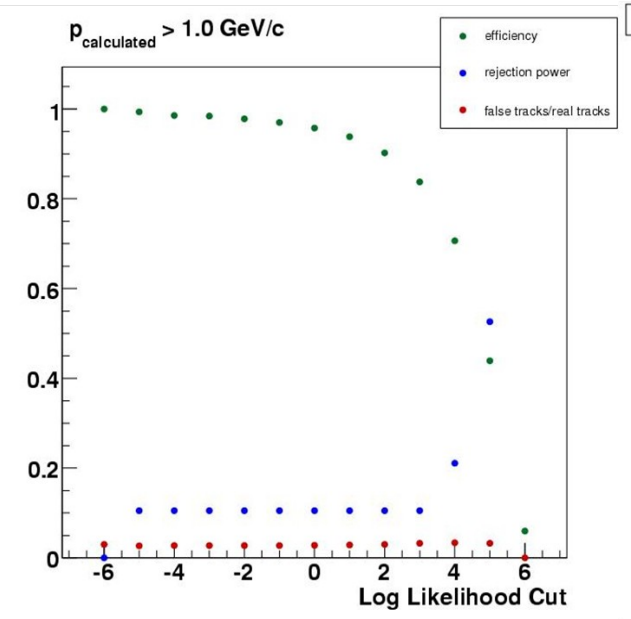
- Show the hit efficiency for each tracking layer in central Au+Au (sqrt(s)=200GeV) and p+p (sqrt(s)=200/500GeV) collisions a) for tracking from outside to inside with the existing PHENIX central tracking detector and b) from inside to outside without the existing PHENIX central tracking detector.

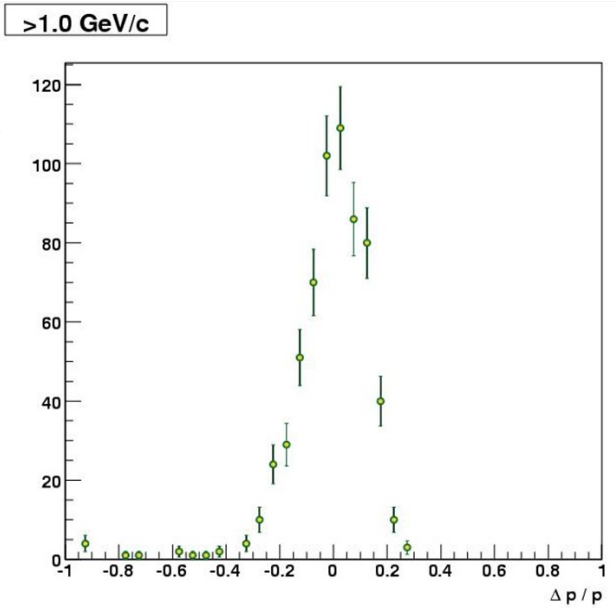
b) was partially answered by Alan's studies. The black plot shows standalone tracking efficiency for backup option in AuAu. Charge sharing not implemented.

a) is being worked on by Richard Petti



Old simulation results (stripixel)





a) Tracking performance:

- What is the level of S/N for the strip-pixel system that is acceptable for the tracking with and without the central PHENIX tracking system?

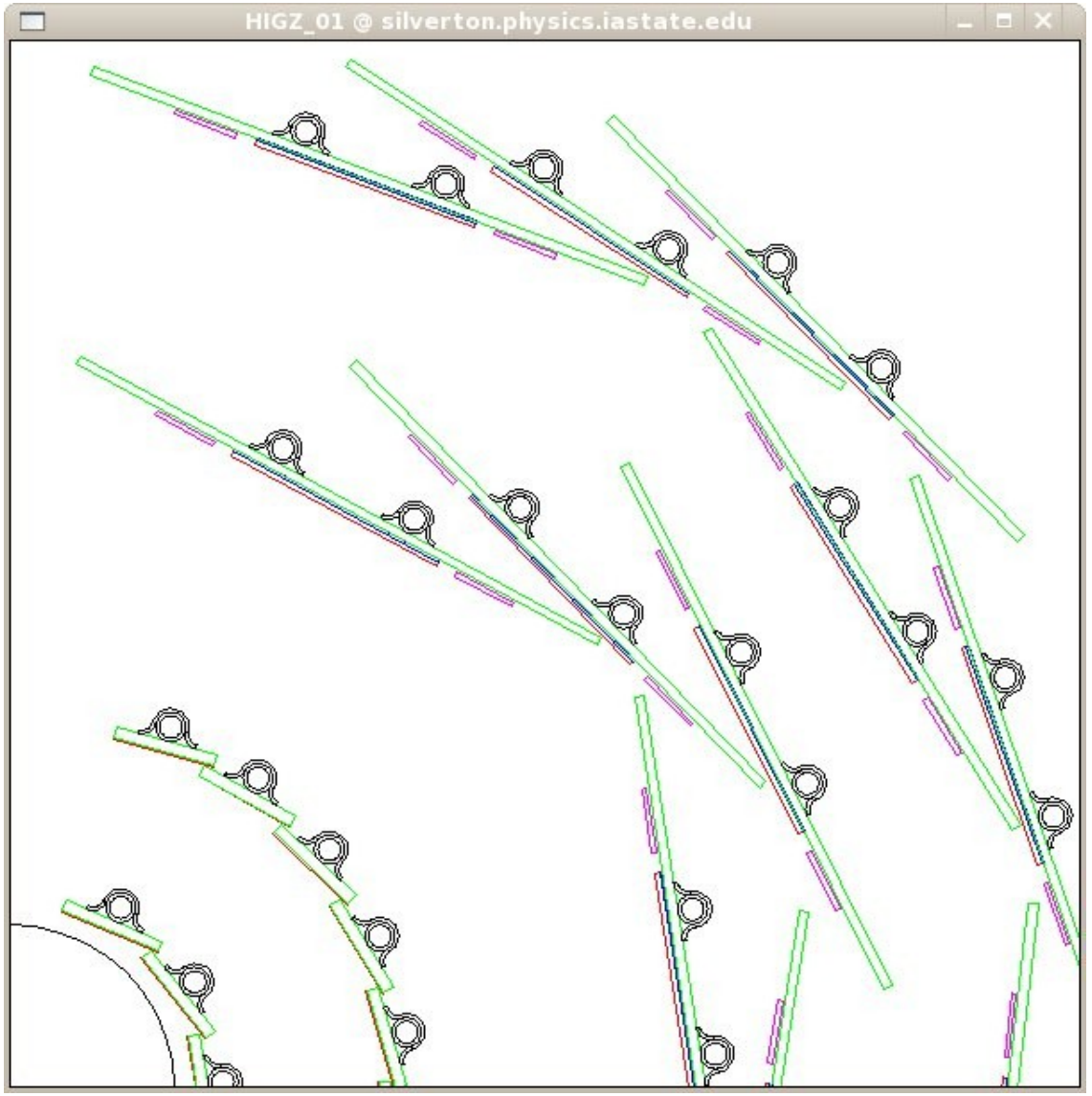
Noise is implemented in VTX reconstruction software. Recent updates by Kenichi to improve speed.

Standalone tracking: tests for low multiplicity events: it works, but there are many low momentum ghosts. They are easy to get rid of with ~0.2 GeV pT cut. Need to check for AuAu.

Global tracking: This is closely related to the previous question (a.1.a). Richard Petti is working on it.

b) VTX material budget:

• Document the level of details that has been included for each tracking layer and the mechanical support structure.



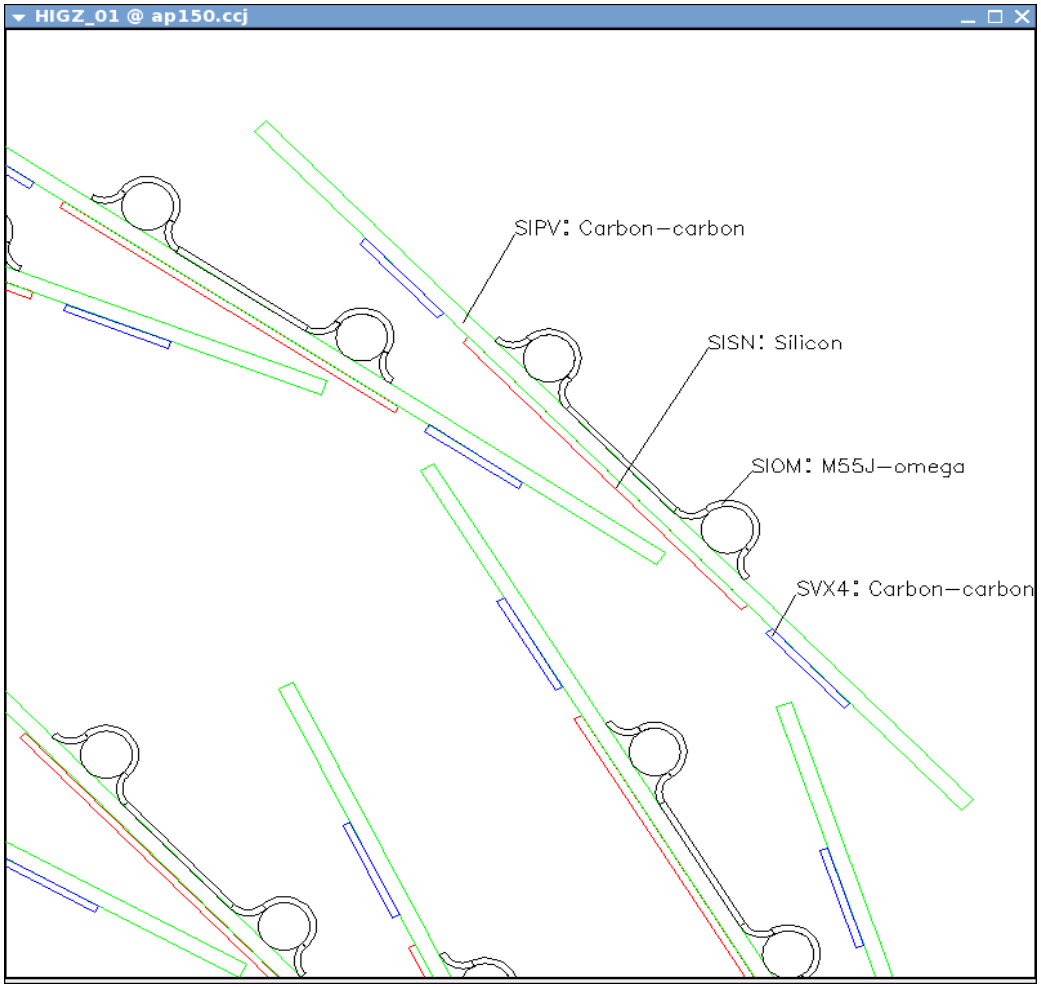
Pixel layers: sensor: 0.214%
passive material: 1.9%
total: 2.114%

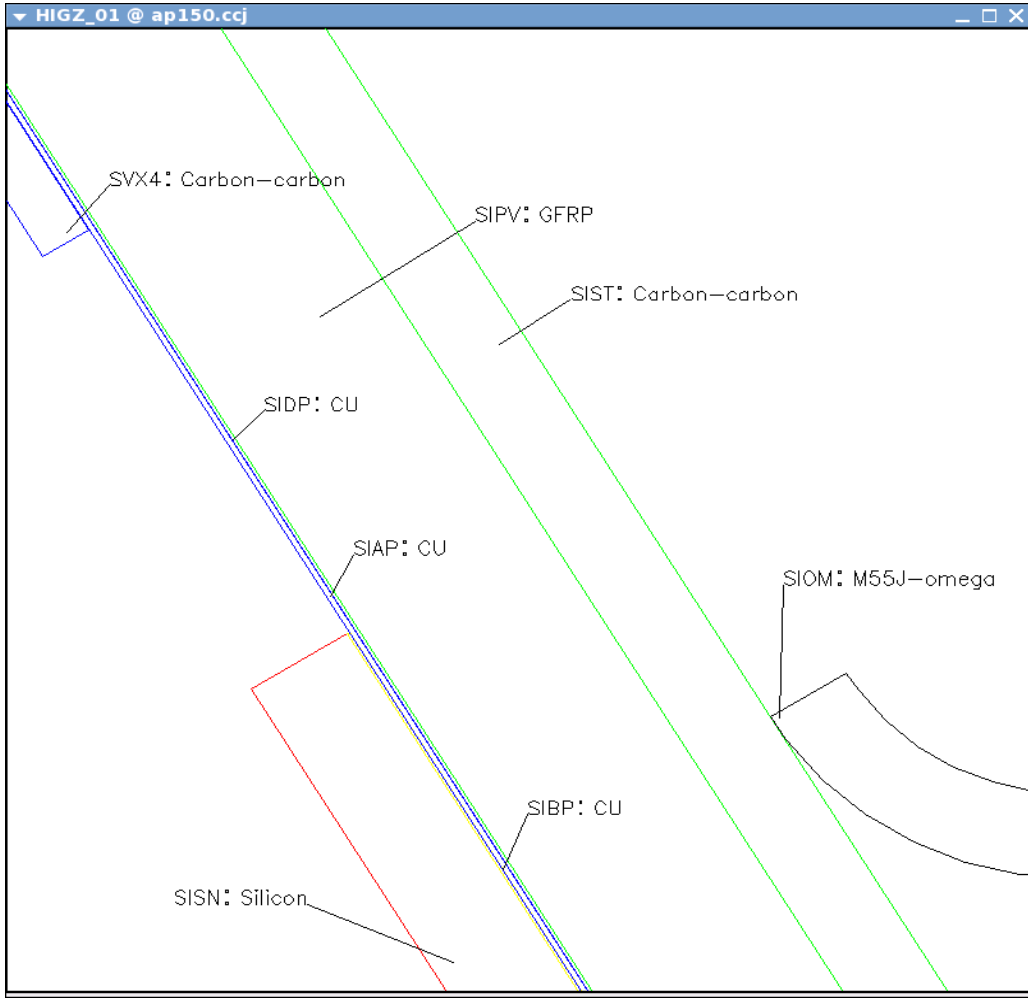
Strip layers:
"thick area" (under sensor): 2.04%
"thin area": 1.25% (copper, G10, carbon)
total: 2.04%+1.3*1.25%=3.7%

plus: SVX4(0.16%), omega pieces, and cooling for each layer

plus: beampipe, support rings, support posts, cables.

Slide 4 continued...

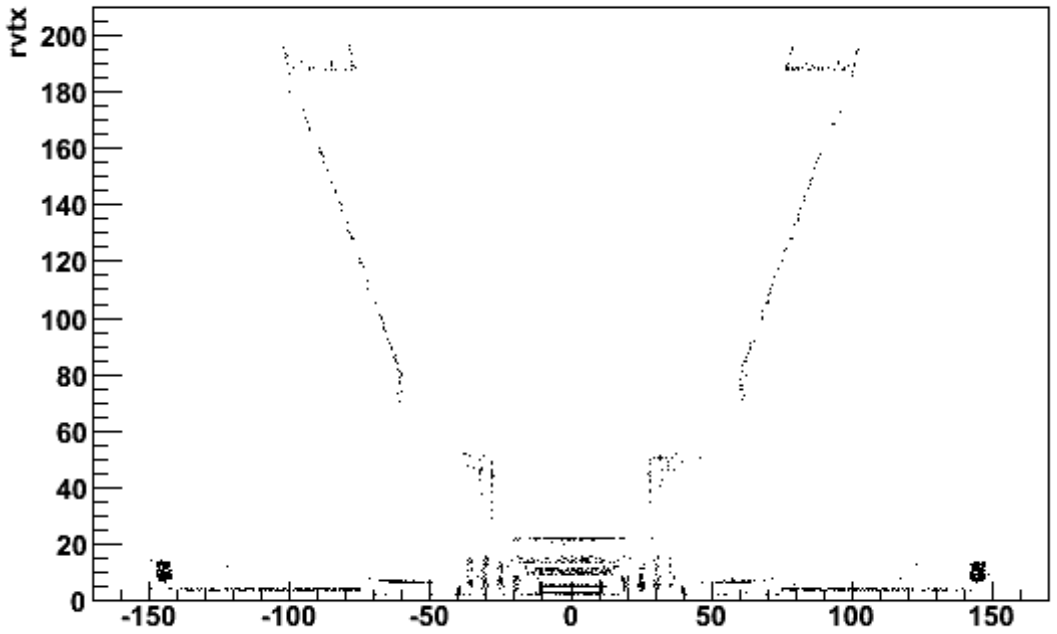




b) VTX material budget:

- To what extent has the impact of albedo particles been taken into account in simulations, such as albedo particles from the NCC?

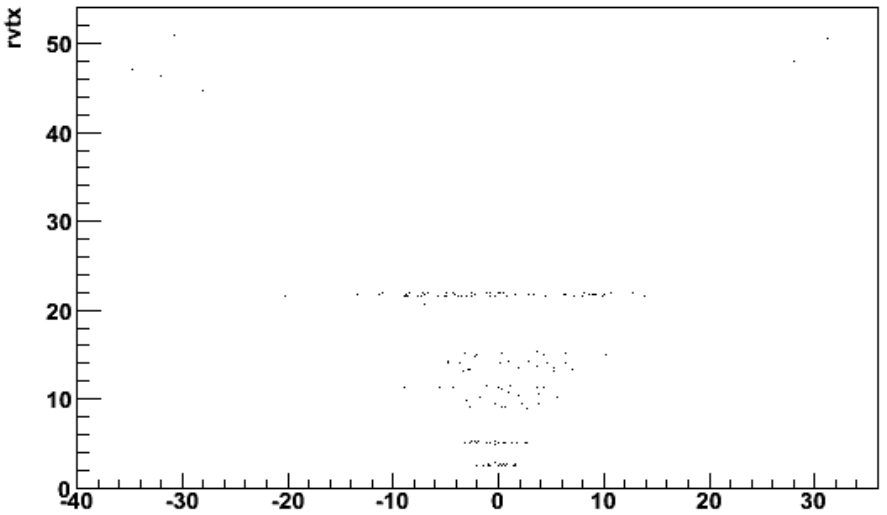
All Phenix material in included in the simulations.



All conversions: 3795 entries

Conversion points from 100 MB Hijing AuAu events

In PHENIX acceptance: 159



Albedo particles are not important.

b) VTX material budget:

- Show the VTX material budget as a function of pseudo-rapidity and azimuthal angle.

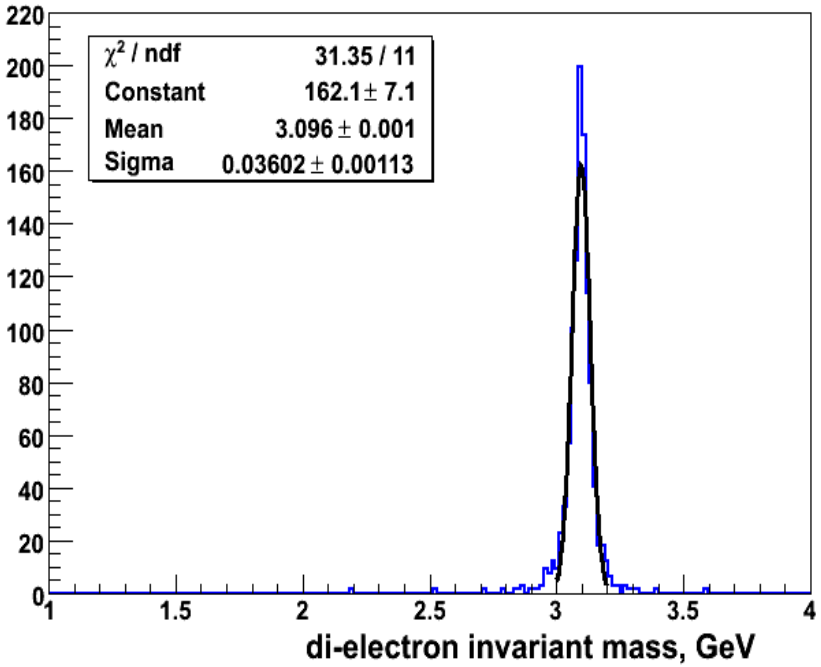
Maki Kurosawa is working on this.

b) VTX material budget:

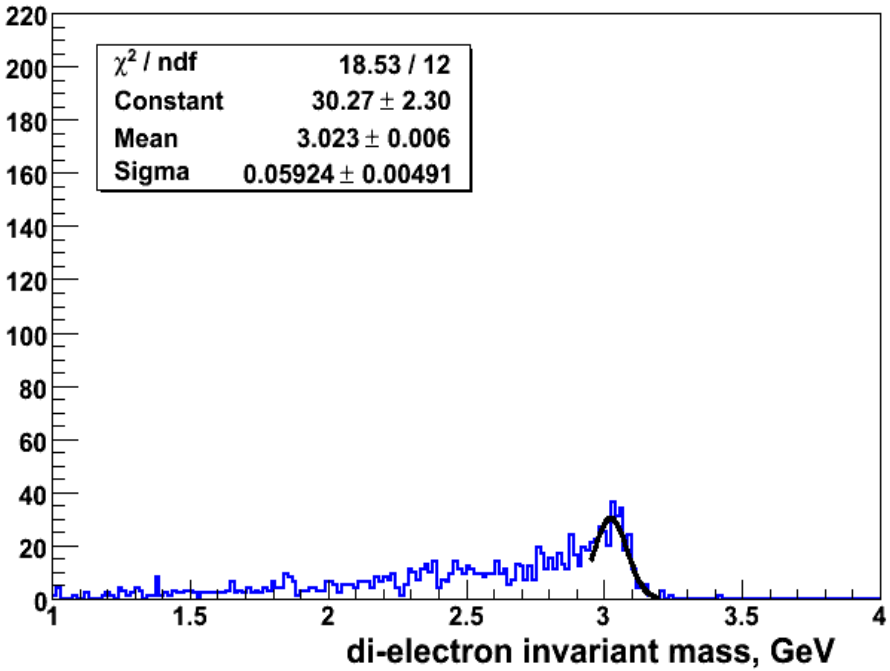
- What is the VTX material budget that is tolerable by the PHENIX collaboration as a whole: J/ψ program, non-photonic electrons and DCA resolution necessary for a successful discrimination of charm / bottom? It appears that the total material budget for the current VTX design is ~16% X0. This is an issue that has to be addressed as soon as possible to allow for potential re-direction of efforts on the actual VTX layout for layer 3/4.

Single J/Psi simulated and reconstructed with and without VTX.

VTX OFF



VTX ON

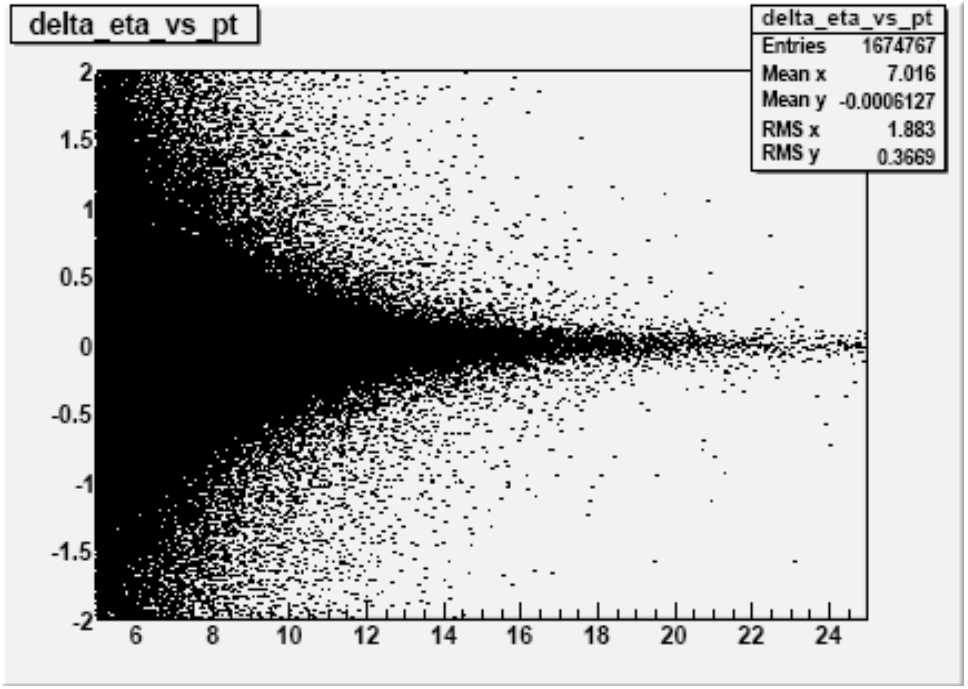


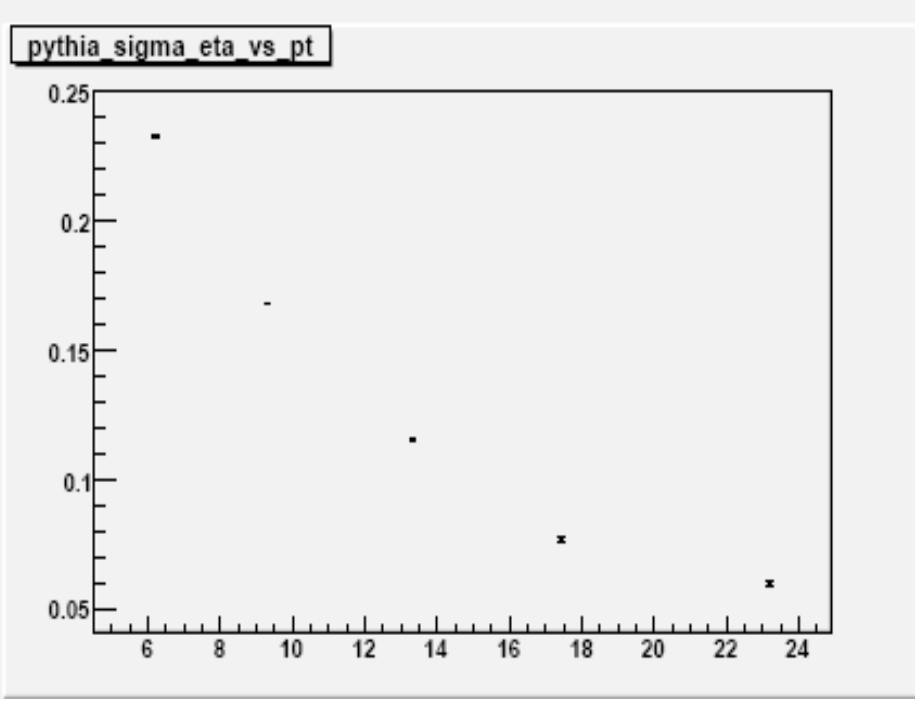
c) Photon-jet measurements / Jet measurements:

- What is the resolution of the jet pseudo-rapidity for jets for which only the VTX is used? How does this change when including the existing central tracking system? How is this dependent on pT in particular for the case of VTX only tracking?

PYTHIA -> PISA ->Standalone tracking ->FastJet

Need to check how it works for AuAu events





c) Photon-jet measurements / Jet measurements:

- What is the pT reach of jet reconstruction in general for VTX only tracking?

Shawn Whitacker (ISU) is working on this. The main issue is that standalone tracking can not tell particle momentum above 5 GeV.

c) Photon-jet measurements / Jet measurements:

- What is the efficiency for photon-jet reconstruction and therefore the impact on the accuracy of various observable measurements involving photon-jet measurements for an assumed integrated luminosity?

d) Heavy-flavor measurements:

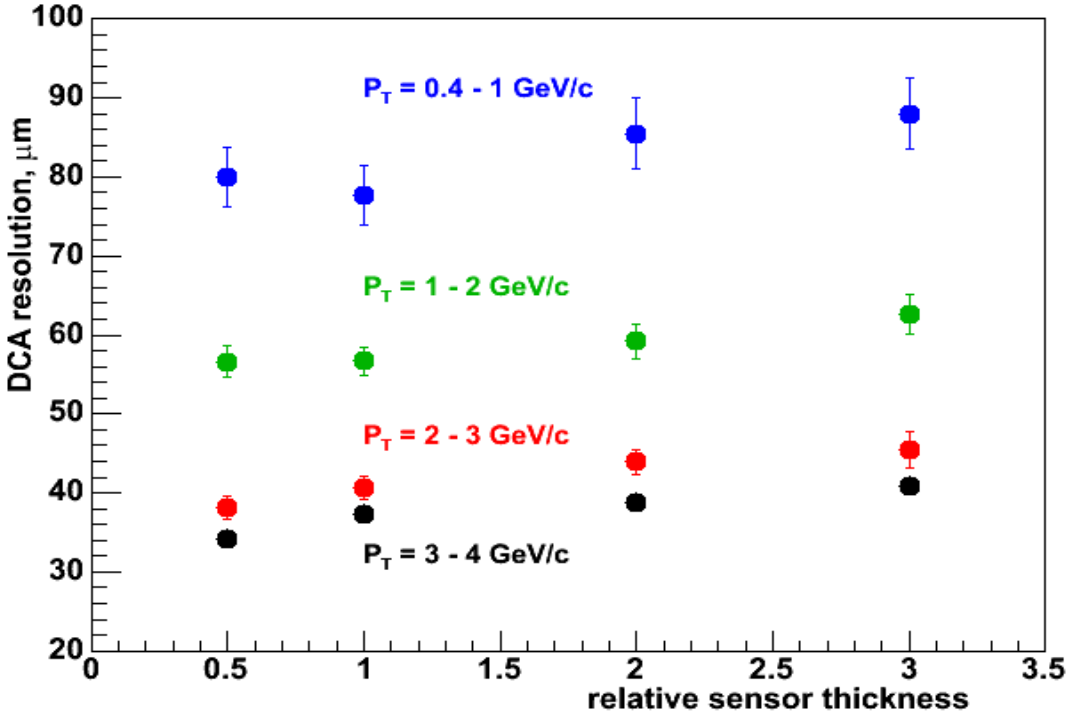
- How is the DCA value of 50 μm justified for various heavy-flavor measurements? What drives this number? How well can charm and bottom events really be separated?

A FVTX/VTX blind analysis challenge has started. Goal is to quantify capability to separate charm/bottom by blind analysis of simulated data. The time scale is probably beyond August technical review, but some results could be ready.

d) Heavy-flavor measurements:

- What is the status of the DCA resolution studies using the full VTX material thickness?

DCA resolution study vs amount of material is under way at ISU (Andrew Bergstrom and Sasha Lebedev). Old results indicate only weak dependence of DCA on amount of material.



d) Heavy-flavor measurements:

- Demonstrate the level of semi-leptonic electron reconstruction taking into account the impact of material thickness giving rise to conversion background.

FVTX/VTX blind analysis challenge?

d) Heavy-flavor measurements:

- What is the efficiency for heavy-flavor type measurement and therefore what is the accuracy of various observable measurements for an assumed integrated luminosity such as R_{AA} and v_2 in Au+Au and d+Au collisions and A_{LL} in polarized p+p collisions?

Stefan???