Software Update

S. Margetis, KSU

Outline

- Critical items/tasks for Run-13/14
- Progress/Risk-list update
- Survey plans
- Upcoming Internal Reviews
- Resource overview and needs
- Slow controls / On-line stuff

Schedule/Milestones (Flemming)

Software	**0%**	**464 days**
Online	**0%**	**464 days**
PXL	**0%**	**251 days**
metrology conversion into hit point software	0%	20 days
data format unpacker	0%	17 days
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plot generation and analysis of status header	0%	60 days
L3 - PXL online software ready for engineering run	0%	0 days
Online Software for production PXL	0%	45 days
L3 - PXL online software ready for production run	0%	0 days
IST	**0%**	**284 days**
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Pedestal software	0%	50 days
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Update software for IST layer	0%	60 days
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SSD	**0%**	**195 days**
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Create Online Plots	0%	1 mon
Create, Program and Test Pedestal Algorithm	0%	20 days
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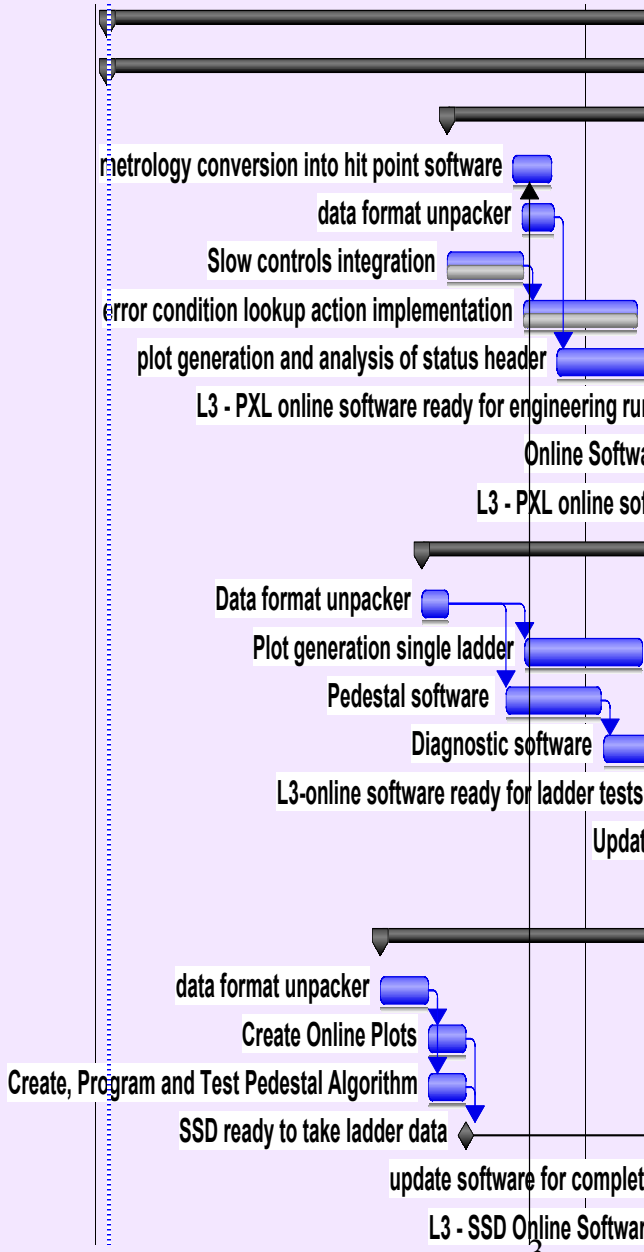

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production ladders	0%	4 mons
L3 PXL Database entry delivered	0%	0 days
Analysis of IST	**0%**	**60 days**
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L3 IST Database entry delivered	0%	0 days
Analysis of SSD	**0%**	**60 days**
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L3 SSD Database entry delivered	0%	0 days
Global Alignment	**0%**	**240 days**
Software Development	0%	12 mons
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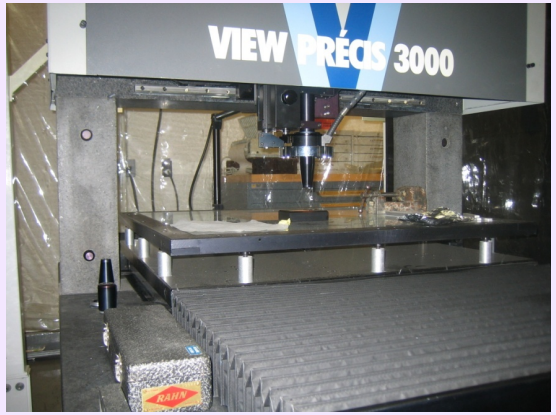
L3 - Alignment software for Engineering Run	0%	0 days

Prioritized list of activities for this/next year

- Survey + related work (on-scope)
- HFT Geometry model update
- Slow/Fast PXL response simulation
- Prototype tracking
- Conventions (naming docs)
- 'online' data format/slow controls/online QA/Db considerations
- ----------
- Evaluation/Analysis framework
- ----------
- Kalman fitter for decays
- Tests of new STV tracker
- Hit reconstruction
- Event vertex finders

- **Survey plans and measurements**

- Hao is 'looking' at a thinned chip data with the new machine's camera.
- See Howard's talk for details



- **HFT Geometry model update**

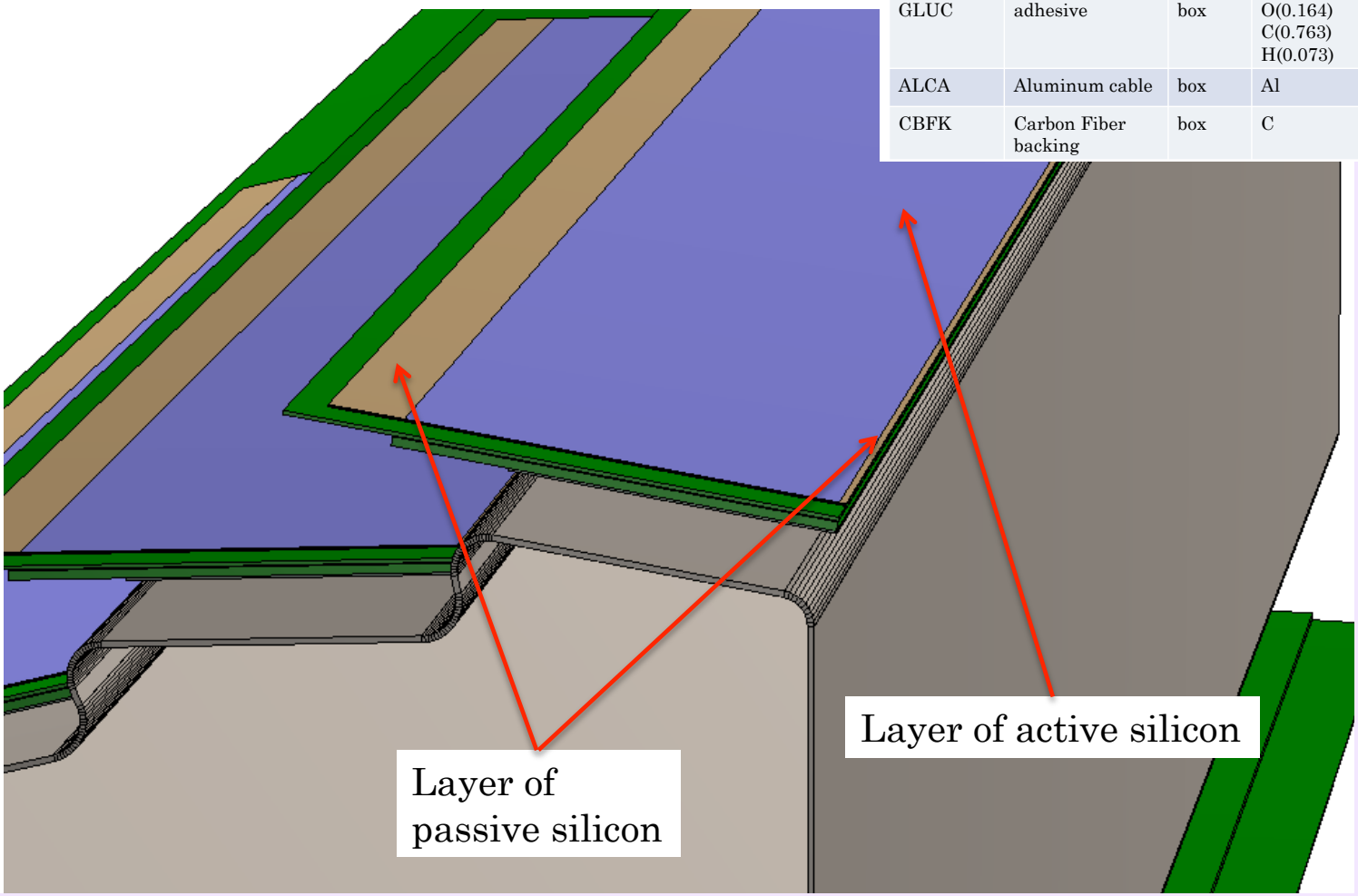
  - Good progress here (Jonathan/Flemming)
  - We have a Y2013 draft-geometry in CVS
    - we ~~sort of~~ have a BFC chain that works
  - We had an internal review last Friday*
  - We also started playing with SSD ladders -> IST

* http://drupal.star.bnl.gov/STAR/event/2012/03/09/hft-software

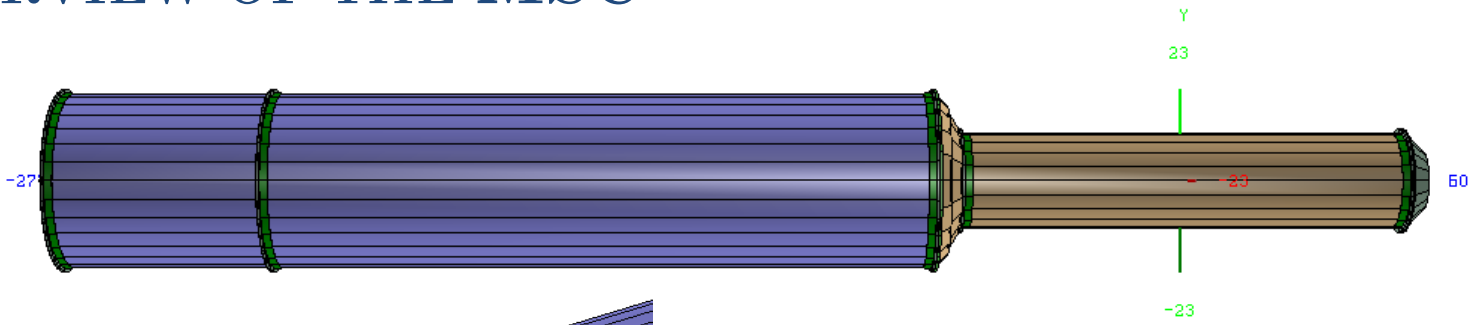
PXL sector modeling in GEANT

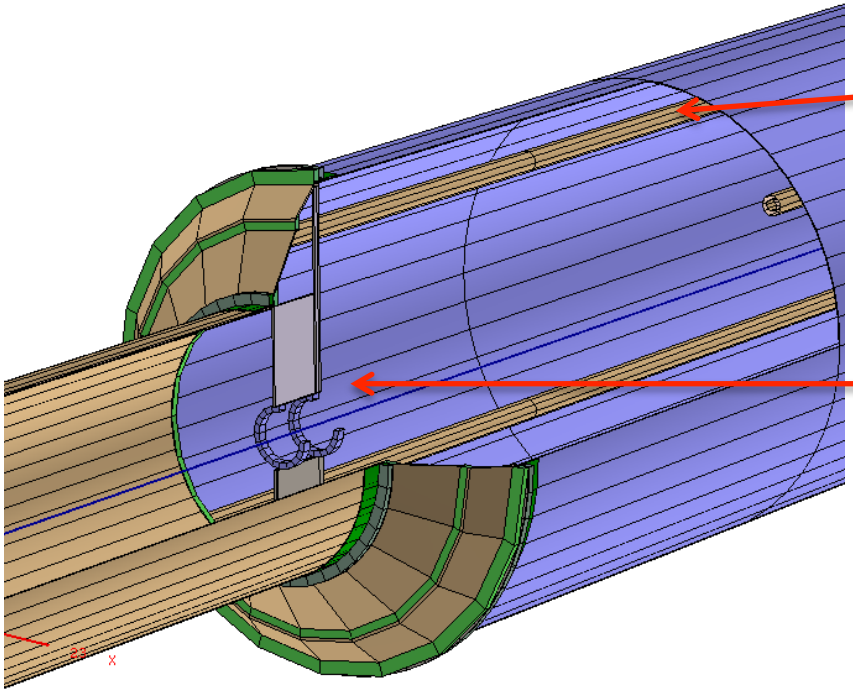
SUMMARY OF MATERIAL BUDGET

GEANT NAME	piece	shape	Composition / mixture	Radiation length [cm]	Density[g/cm^3]
PLAC	Silicon active	box	Si	9.36	2.33
SIFR	Silicon passive	box	Si	9.36	2.33
SIFL	Silicon passive	box	Si	9.36	2.33
GLUA	adhesive	box	O(0.164) C(0.763) H(0.073)	34.7	1.2(*)
GLUB	adhesive	box	O(0.164) C(0.763) H(0.073)	34.7	1.2(*)
GLUC	adhesive	box	O(0.164) C(0.763) H(0.073)	34.7	1.2(*)
ALCA	Aluminum cable	box	Al	23.7(*)	2.7(*)
CBFK	Carbon Fiber backing	box	C	68(*)	1.3(*)



Overview of the MSC





rails

Rings surroundings the beam pipe

•: temporary until implementation of real material (slide 39)

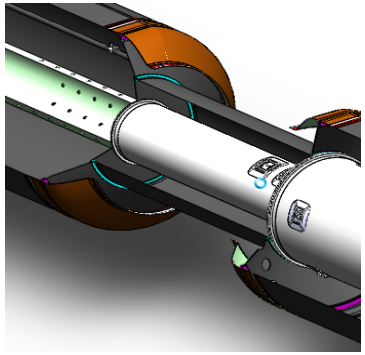
GEANT NAME	piece	Composition / mixture	Radiation length	density
ALL(*)	Carbon Fiber	C	23.9	1.3(*)

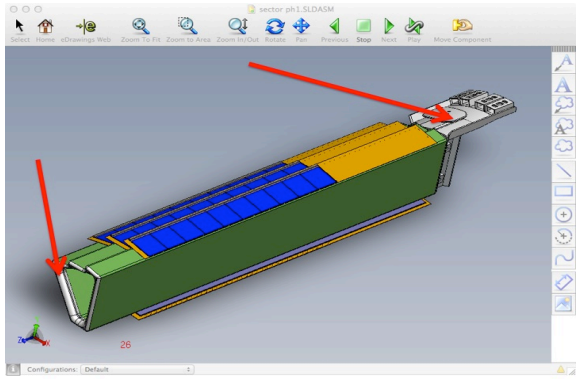
NEXT STEPS

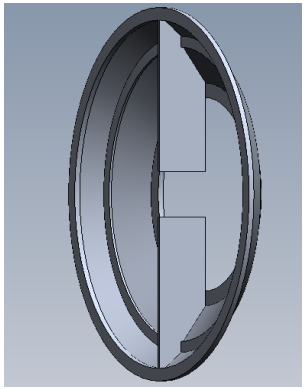
- Refine material budget for the MSC (slide 39)

- Remaining "big" parts of the MSC and some corrections :

shrouds







- Representation of ladder's cables (slide 38)

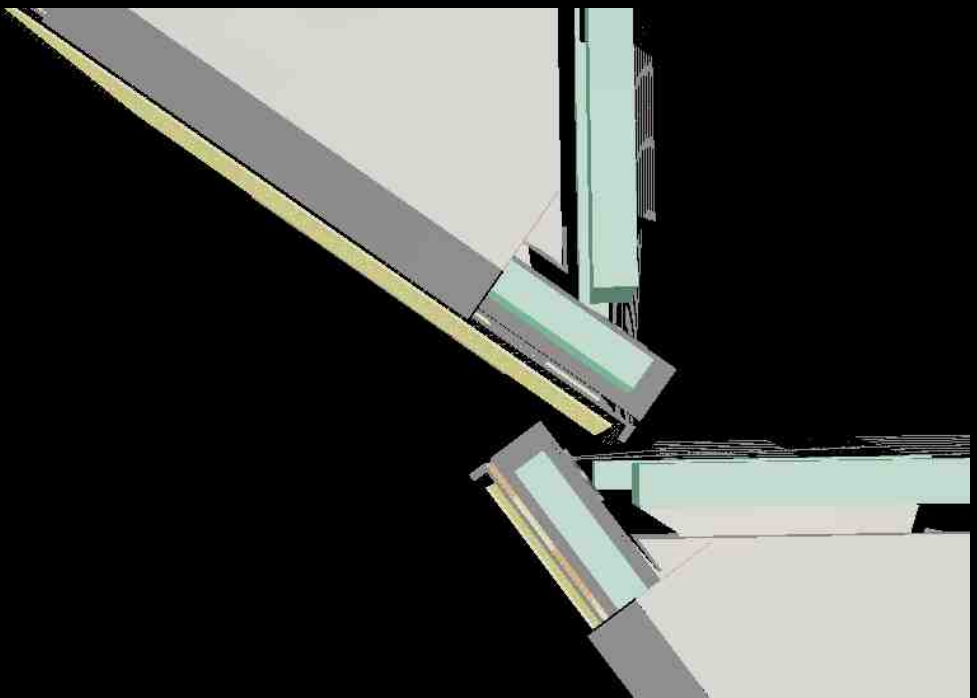
- Cu, low mass (transition cables)
- Mass termination boards (z=~96cm)
- Heavy signal cables (up/down only)
- ??? (Other TBD)

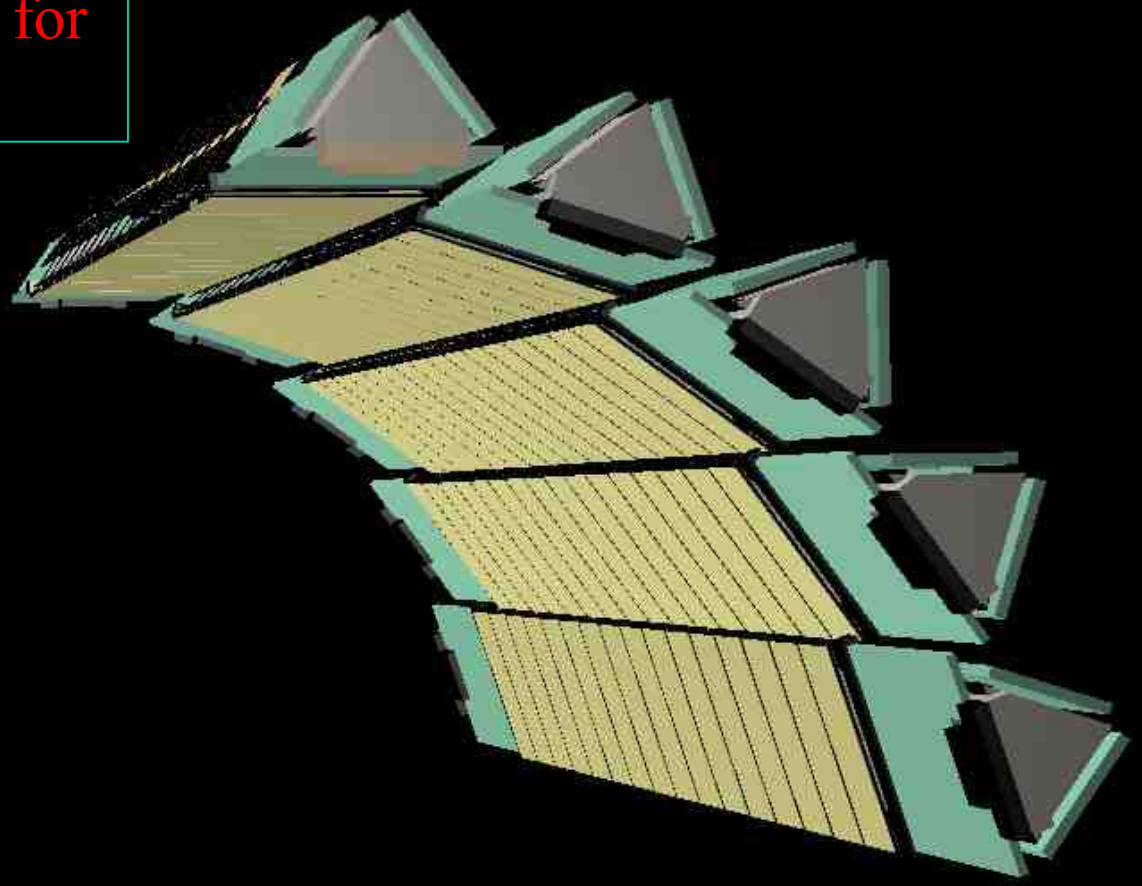
- **Other action items/points made at review**

  - Beam pipe needs to be finalized
  - HFT support cones are attached to TPC (like SVT)?
    - Impacts geometry/alignment work
    - Answer is 'yes'
  - Use official pile-up mechanism, study UPC e^- in detail, ask PHENIX about background
  - Use VMC for (mis-) alignment MC studies
  - Code needs to be segmented so that ladder/sector etc geometry corrections can be applied in GEANT too.
  - A lot of code clean-up comments from Jason

Y2014 SSD --> SST

- Need updated models for SSD and IST



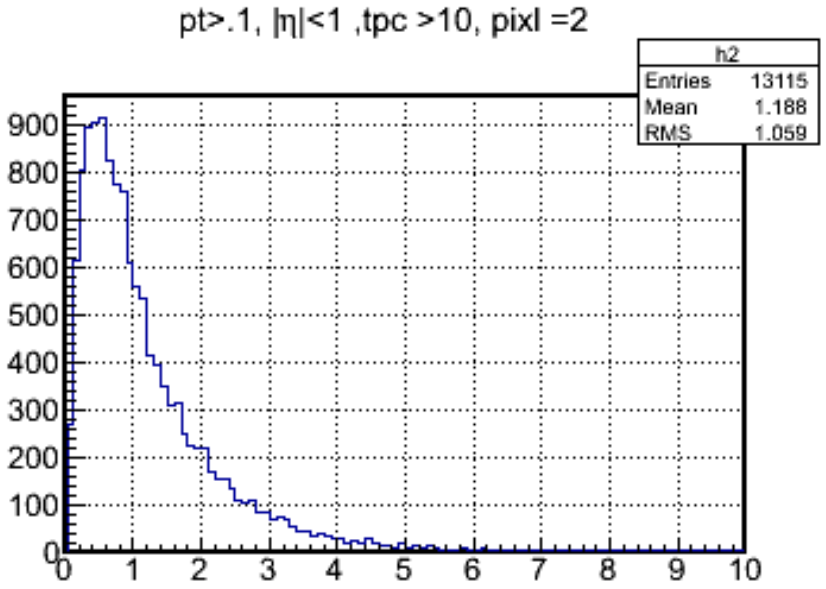


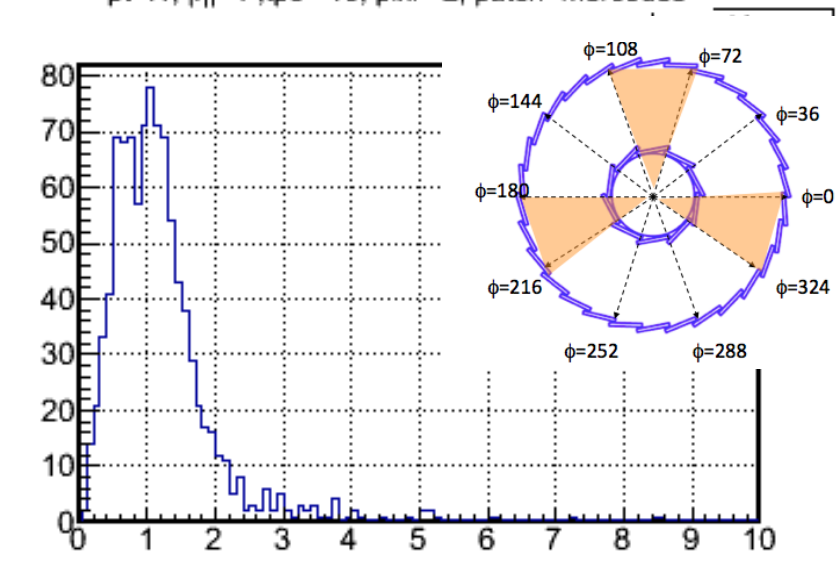
- Slow/Fast PXL response simulation

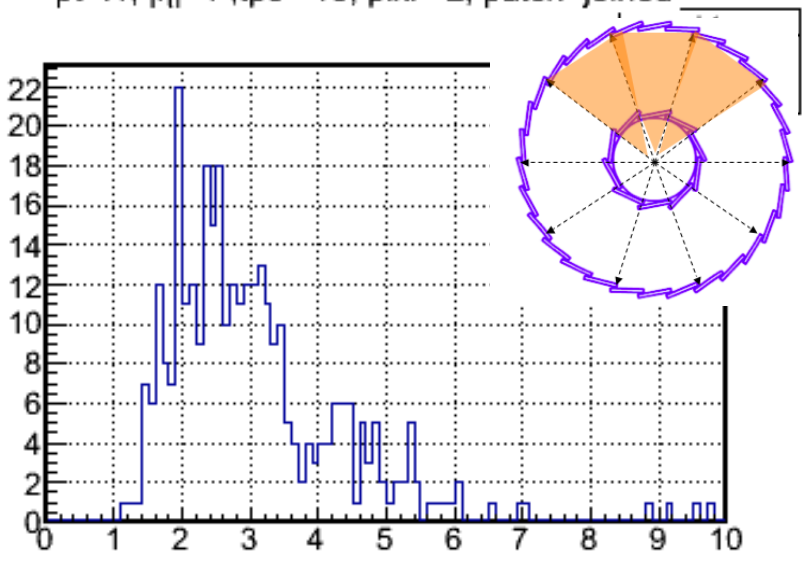
  - CERN data (inclined incidence) can fix most parameters
    - analyzed by IHPC
  - …time to revive the link

- **Tracking with TPC+PXL prototype?**

  - Initial simulation work with simplified UPGR15 geometry **done**
  - Acceptance and Tracking efficiency defined for two configurations of 3 sectors
  - Xin, Hao, Yifei look at the code
  - Rates and new updated simulations with new geometry/trackers planned



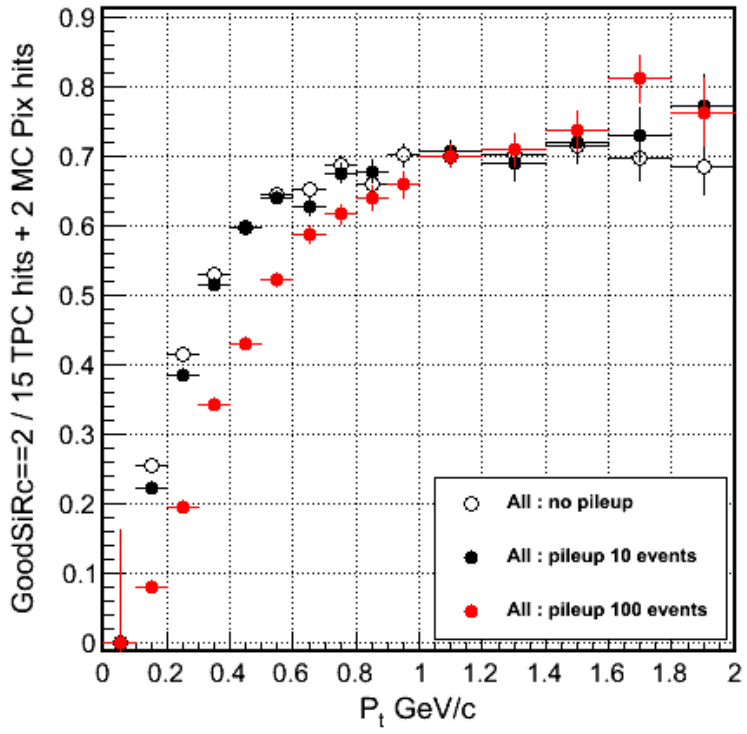


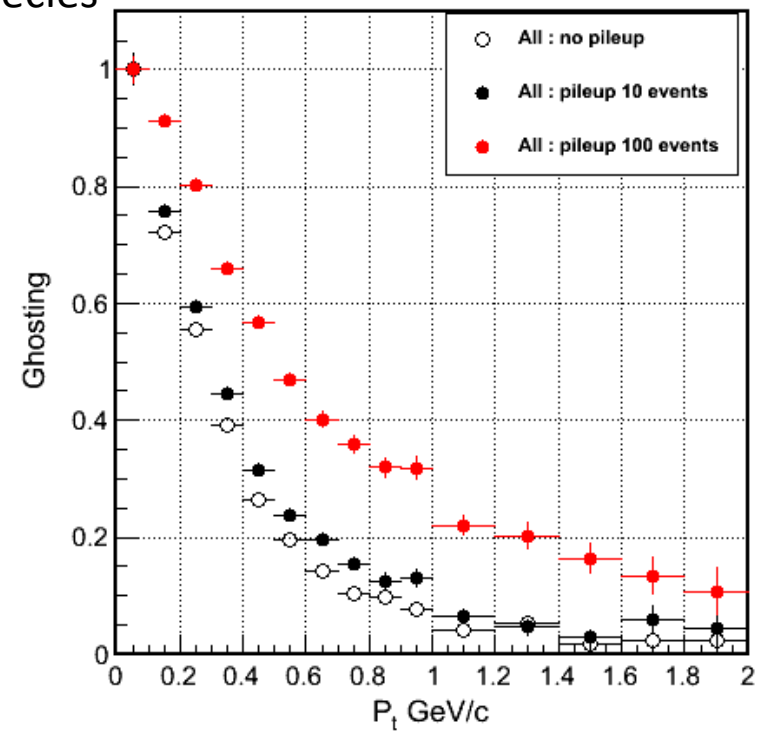


acceptance D0

Single track efficiency and ghosting

All species

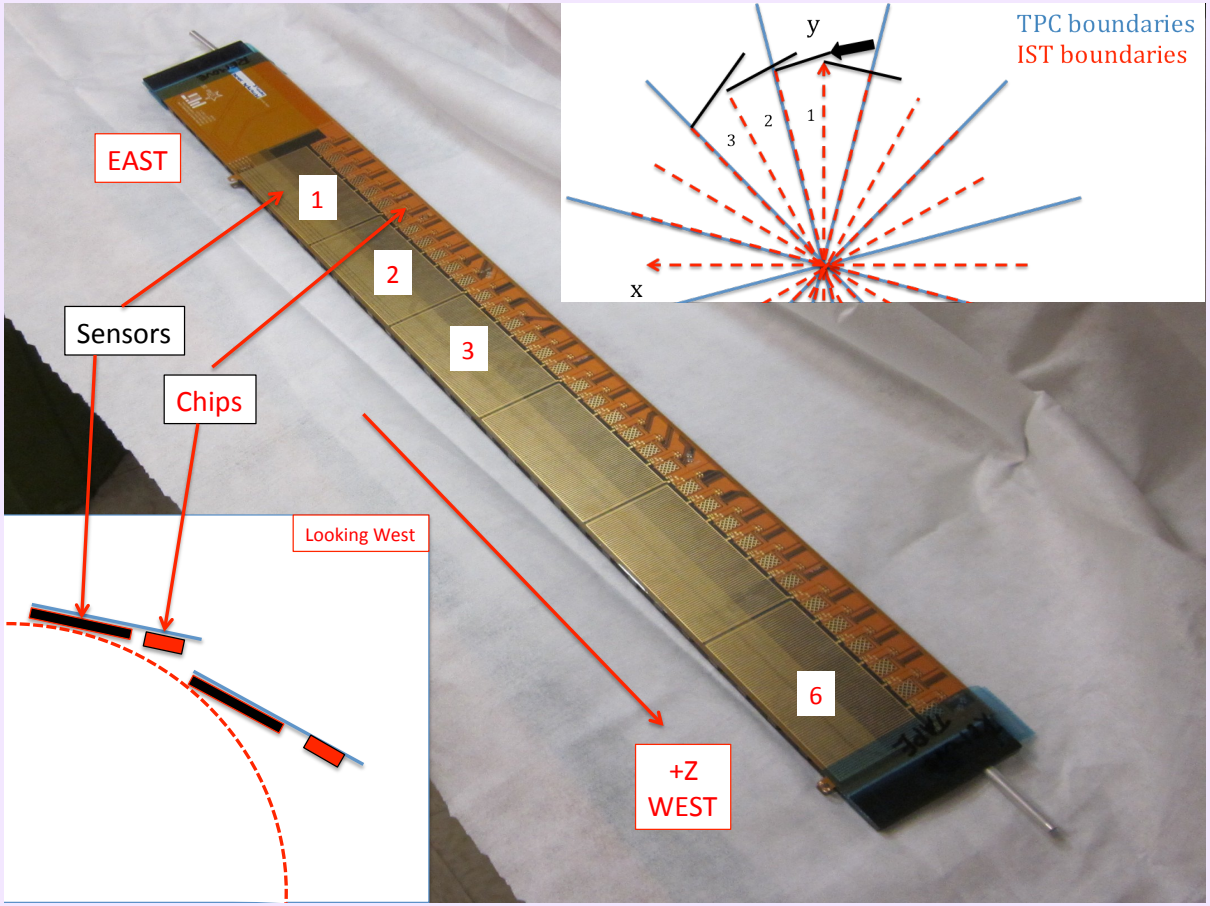




* Assuming everything else is ideal

- **Numbering convention**

  - We have an agreement and a document (Flemming/Howard(s) et al.)
    - need to put it somewhere after HG, JT edit it
    - The document (.pdf) and a talk about it is in the link below



http://drupal.star.bnl.gov/STAR/event/2012/03/09/hft-software/hft-numbering-schemedoc-10

- **Manpower**

  - Well…some good news for a change this time:
  - LBL has Hao Qiu (survey, simulations, physics) and also Jan Rusnak for ~ 2 months (CMM programing)
  - Amilkar is officially now a grad student in Kent. He will move to BNL in June (geometry, simulations, alignment)
  - but still…a couple of full time PhDs are needed

CDF and D0 had about 3 times the manpower on their silicon?

- **Upcoming reviews**

  - Survey software review
    - April/May 2012

  - Alignment prototype software review
    - This Fall sometime

Summary

- Need to wrap up Geometry work soon
  - to start simulations (Geometry, Tracking, Alignment)
- Hopefully Survey work is in a good path now
  - critical mass I think is there
- Around Fall we should start preparing for Analysis-mode too!

Schedule/Milestones (Flemming)

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