

Software Update

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- Brief Update - status report
- Immediate plans - priorities
- Summary

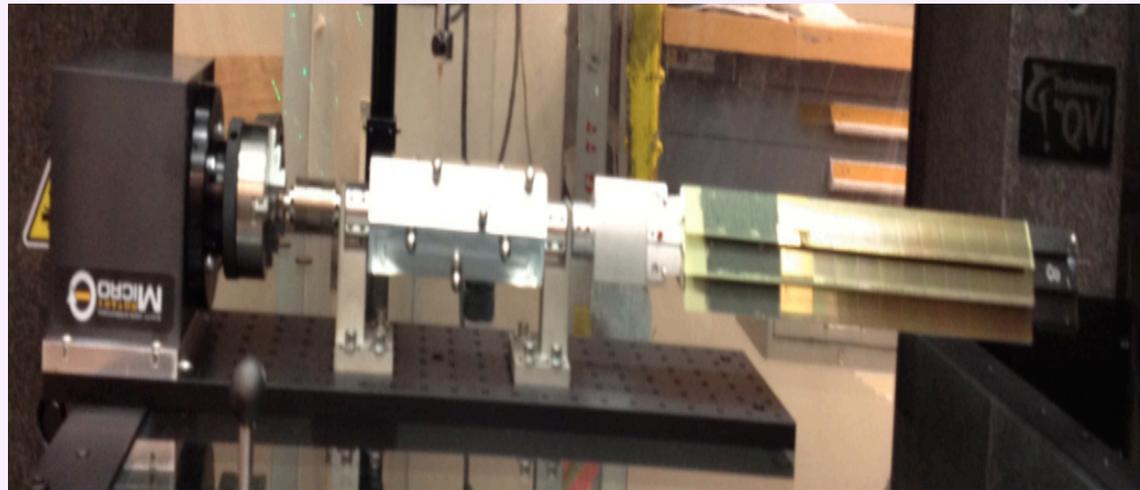
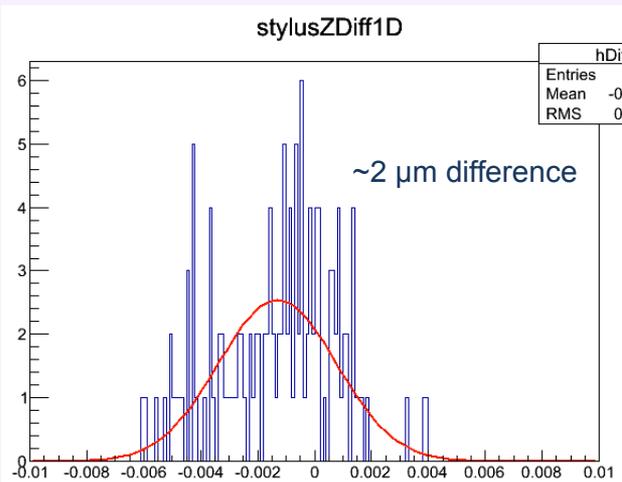
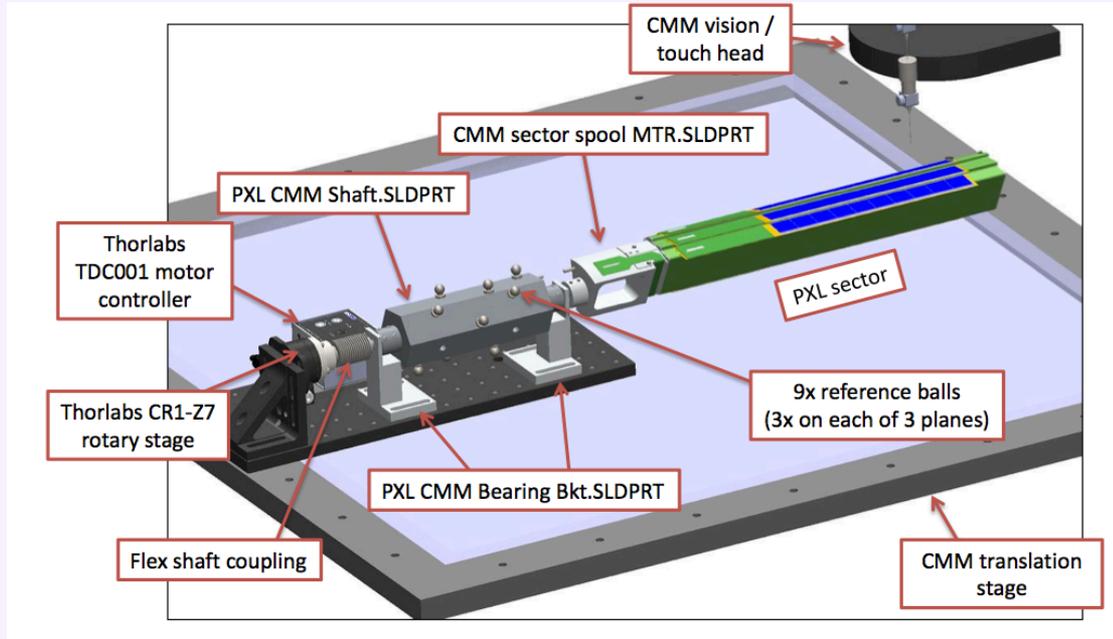
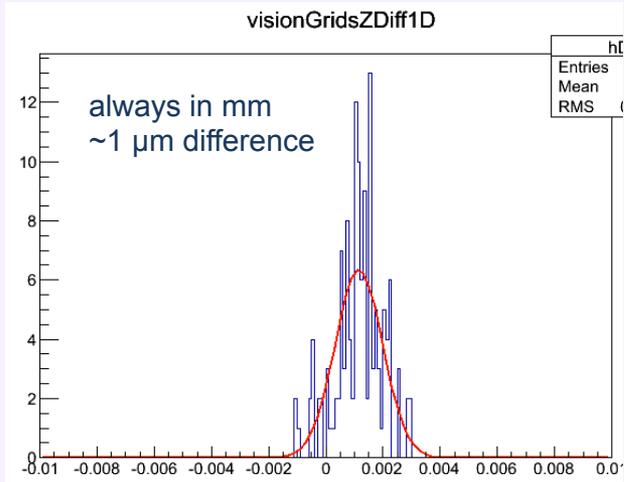
Activities since mid-July (OPA review)

- PXL Survey + related work
- CA tracking with HFT
- IST Simulation environment
- HFT Geometry model - Run13 update
- HFT Geometry for Alignment studies - DEV14
- Event vertex classification/evaluation

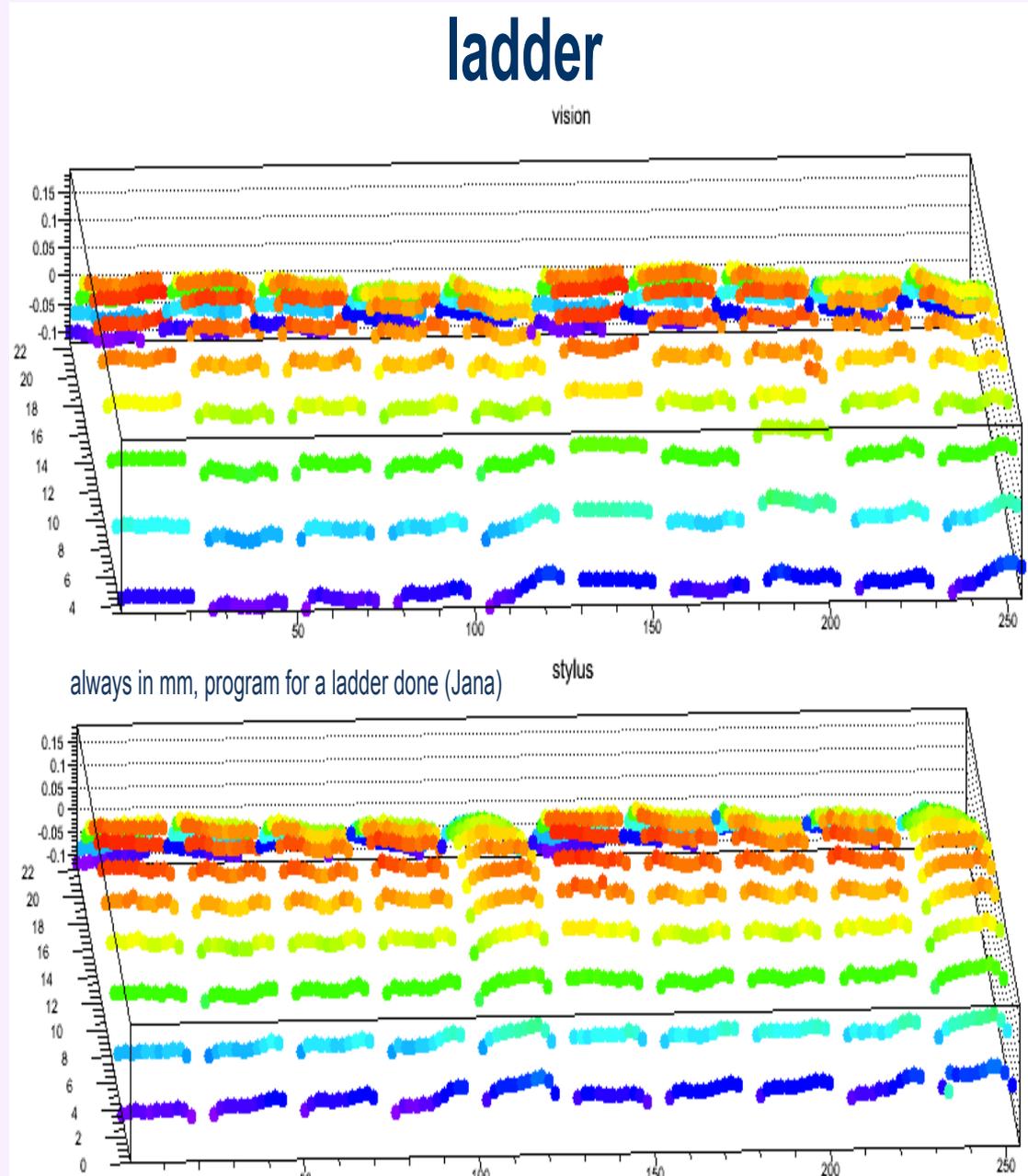
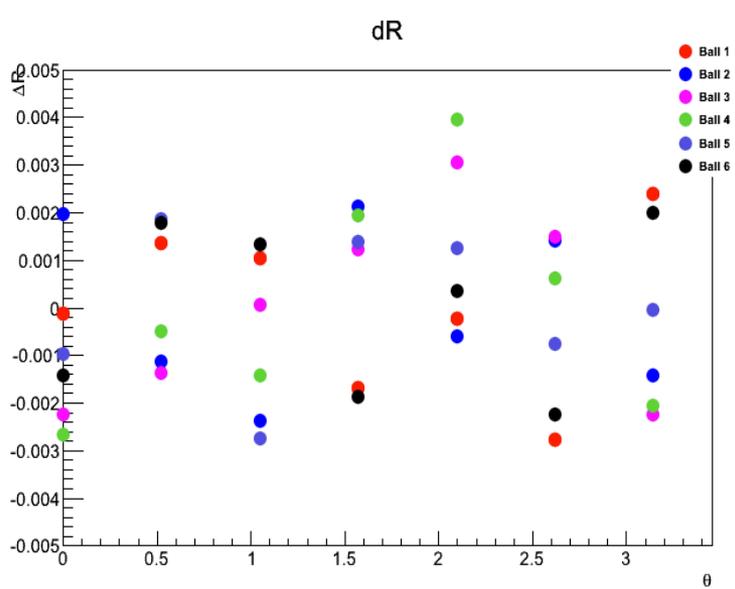
Survey progress

- *Survey work at LBL on schedule*
- **PXL:**
 - Full ladder scan are now possible
 - Repeatability of Vision/Touch probe within a few microns
 - Still there is a ~40 difference we need to resolve
 - Axis wobble under control, within acceptable limits
- **SSD/IST:**
 - No activity for the reported period (that I am aware of)

Survey progress

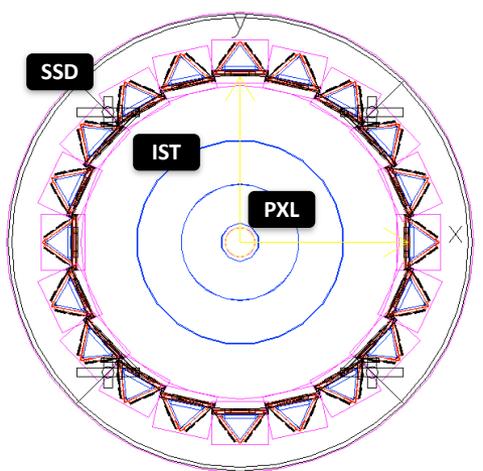


Survey progress



CA Tracking in HFT

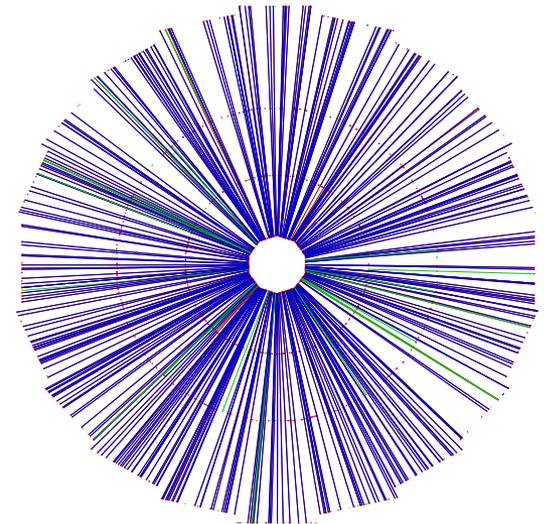
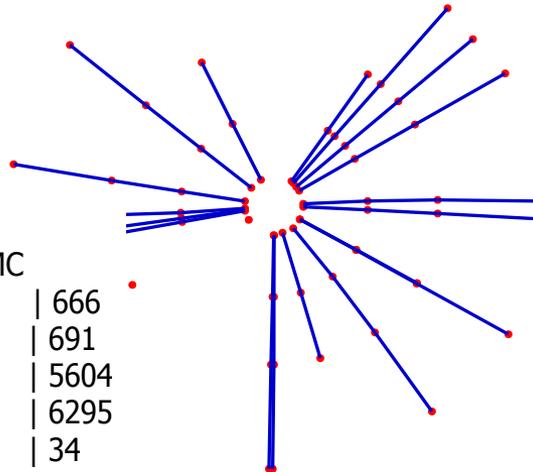
- Idea is to form track segments with HFT hits alone - many benefits
- Ivan et al. came to BNL to make some tests
- UPG15 geometry with nopileup AuAu 200 central - poor results - need work
- Low priority - lack of manpower - tabled



HFT CA Track Finder Performance

Simulated MC Tracks: primary, $0.1 \text{ GeV} < P < 5 \text{ GeV}$

- Red Lines - MC Tracks with $P > 1 \text{ GeV}$
- Blue Lines - Reconstructed Tracks
- Green Lines - Ghosts



Au+Au events, central, 200 GeV

---- Global Performance 5 events Statistic ----

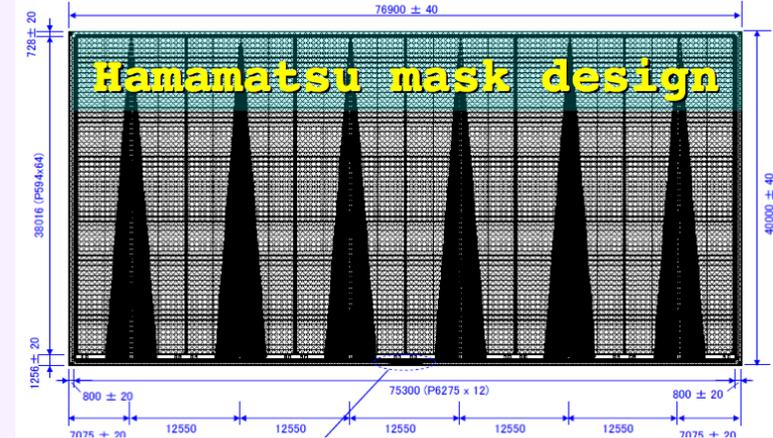
Track category	Eff	/ Clones	All Reco	All MC
LRefPrim efficiency	: 0.740	/ 0.000	493	666
Refset efficiency	: 0.745	/ 0.000	515	691
Extra efficiency	: 0.241	/ 0.000	1350	5604
Allset efficiency	: 0.296	/ 0.000	1865	6295
Rest efficiency	: 0.000	/ 0.000	0	34
Ghost probability	: 2.363	4407		

All reco tracks/ev : 373.000

Reconstruction Time Real = 29640.951 ms

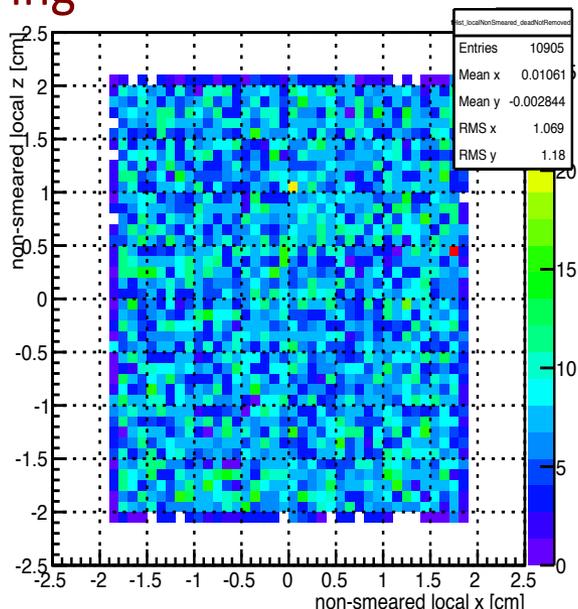
- IST Software

- UIC entered dynamically the field (sigh)
- Some work on the IST fast simulator already done
- Work on IST geometry details, data analysis and structures and survey are near future tasks.



w/o smearing

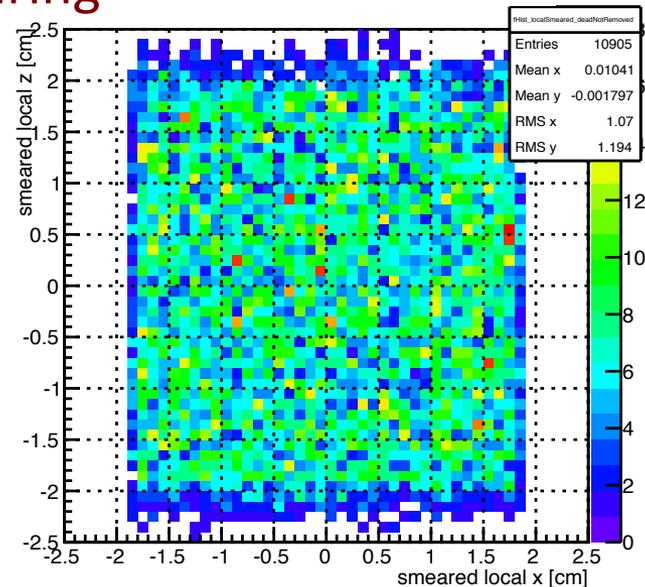
IST hits nonSmearred local position x vs. z



$|x| < 3.6823/2$
 $|z| < 4.04/2$

with smearing

IST hits smeared local position x vs. z



- HFT Geometry for Run-13

- Jason asked us to finalize the Run-13 geometry material
- Flemming prepared some drawings with major pieces of mass that need to be added
- Amilkar is coding them now

- HFT Geometry for Run-14 (and Alignment work)
 - These are two separate efforts that need good coordination otherwise it will be messy. That is where we are...
 - Main thing is that GEANT3 lives in its own universe but data structures like hits need tables to move from local to global etc
 - The mess was dealt in the past by having two separate geometry structures; one for simulations, one for the tracker
 - VMC was supposed to unify platform, resolve issues. It is not there for us and I am not sure if it is going to be implemented given the manpower (ours and BNL core group)...still Yuri has hopes.
 - Initial conflicts were treated, reco chain works now but problem is deeper since hierarchy and structures need to be the same in simulation and data stream if we want to do a proper job
- I propose this to be an agenda item in the upcoming Alignment-procedures review.

- **Alignment work**

- Due to manpower available we work on establishing a working chain using the programs developed for the SVT/SSD
- The SSD and IST should be rather straightforward but new Db structures and programs need to be developed...this is in progress now
- The procedures need to be re-thought and re-defined
- The same for the hierarchies and structures

- **I propose these to be the focus of the upcoming Alignment review**

- We also looked at Millepede (downloaded the code, experiences, examples). No time available to pursue now, so it is tabled but available as a task
- The same with Maxima, an automated, robust way to get the derivatives (interdependencies of alignment parameters). Yuri provided code and example. We will visit this and verify math whenever we can, but task is available

LEVEL-3 Milestones

Software			
3	Review of CMM software progress	4/5/12	5/17/12
3	Alignment software Review	9/20/12	9/20/12
3	PXL CMM database delivered for prototype	11/15/12	11/15/12
3	PXL online software ready for engineering run	12/4/12	12/4/12
3	IST online software for ladder tests	1/13/13	1/13/13
3	Alignment software ready for engineering run	1/18/13	1/18/13
3	SSD online software complete	5/14/13	5/14/13
3	IST online software complete	7/24/13	7/24/13
3	IST CMM database delivered	8/17/13	8/17/13
3	PXL CMM database delivered for production sectors	8/22/13	8/22/13
3	PXL online software ready for production run	10/1/13	10/1/13

- Need to decouple the 'review' from 'readiness'. I proposed issues relevant to the review in the slides before

Software Risks (from my OPA talk)

- **Mitigations**

- Our approach is to use field-proven techniques as implemented in STAR (Kalman tracking, Calibrations, Analysis etc)

- **Risks/Challenges**

- **People: (in)sufficient manpower for tasks**
 - We are addressing this by prioritizing tasks and management actions. Priority is given to on-scope activities
- **Overall environment functionality (tracking etc)**
 - We work closely with STAR S&C management to ensure the soundness of the environment. Also to plan the timely deployment of new tools and infrastructure

Summary (from my OPA talk)

- We have made initial progress on critical tasks
- We heavily depend on STAR S&C support group
- We need to double our efforts (FTE) for next year in order to meet increasing needs