

We have scheduled an internal review on the progress on the survey, calibration and alignment software for the HFT detector. Initial effort to define these tasks has taken place.

In this review we will focus on what survey information will be available for software, how it is used in the tracking software, what databases are needed, and what is the required precisions at which information is known from both survey and construction.

The review will take place at BNL on May 17 in the morning (room 2-84 in physics). We envision that the morning will be used for this. The charge for the committee is:

- Review the specification for required survey. Do they match the requirements for the detector?
- Review and comment on the CMM methods and data sets needed.
- Does the proposed way forward fit with the new STAR software and schedule for having this available.
- Review the proposed manpower and schedule for getting this together for analysis of engineering run data, and for run-14 data.

3) Proposed reviewers (TBC): Y.Fisyak, H.Wieman, E.Anderssen, J. Webb , F. Videbaek (ex-officio)

The proposed agenda content is given below. Spiros is organizing the speakerlist.

- i) Overview/Overall structure/Coordinate system
Hierarchy in STAR and each of HFT subsystems (Spiros)
- ii) The CMM Methods and Data sets needed for each subsystem and how it is going to be obtained.
- iii) Structures and transforms that will use them
in offline software.
- iv) Proposed offline Alignment methods (full review
is scheduled in the Fall)
- v) committee closed session
- vi) closeout.

This review was scheduled as reviewing the progress of the HFT survey efforts, in particular methods, software, requirements and plans for how this will be integrated into the STAR framework.

The committee acknowledges and praises the effort and quality of the material presented. It addressed not only the initial charge, but also additional issues that were discussed during the meeting.

We do not set specific dates on when the recommendations should be done, but will like to see a plan within a couple of weeks, in particular in regard to interactions with the STAR software group.

Review the specification for required survey. Do they match the requirements for the detector?

Findings:

There were some general comments. 20 micron within pixel; pixel to IST 200 microns

SSD says that the requirements for functionality requires ~200microns. The survey will likely be around 50microns. Will take what comes from free.

IST presented a rough draft plan for survey and deliverables.

Comments:

The requirement to PXL ladder internal, ladder-to-ladder and sector-to-sector are stringent. The work so far is aimed at getting the required accuracy and methods. It seems to be progressing well.

The usual lack of use of words accuracy is present. Physicist usually talks RMS and engineers windows etc.

It seems from the not so strict requirements for IST and SSD that survey requirements can be met fairly easily.

Recommendations:

The HFT group should prepare a document that summarizes the requirements for local coordinate accuracy for all three-detector systems (PXL, IST and SSD). This will supplement the information in the CDR. (+ Flemming)

Define the top to bottom set (hierarchy in the geometry model) of transformation structures for all system Magnet to each detector system. Review that these are sufficient, determine from what set of needed measurements these are estimated, and

coordinate with engineering that the necessary survey are done. This requires a walk through of the process. It should be documented in a tabular form.

The Plans for survey for SSD and IST should be laid out in more detail. Since the requirements are not very stringent a main emphasis should be that **sufficient information is obtained in a timely fashion, but also not to spend excessive effort.**

Review and comment on the CMM methods and data sets needed.

Findings:

The survey plan and methods for the PXL sector have been develop intensely though the last couple of months by work by the LBL group.

The specification of Sensor Local Coordinate System (SLS) was described.

The time needed to measure a full sector is in order 6-10 hours

Comments:

The choice of TPS for representation seems to provide sufficient accuracy for the transformation from pixel hit address to x,y,z.

Recommendation:

Investigate the difference between using 42 vs. 132 data points for TPS methods. Ensure that the DB and software is written such that the #points can be changed if so desired later.

Get a better time estimate by starting from the time it takes to survey say 142 points on a single chips rather than multiplying the 5-10 sec per points by a large number. The possibility of using the laser probe (much faster) should be explored.

Provide a first set of data points from the CMM such the methods to define DB records, and to manipulate these can be developed and tested

Ensure that the documentation on surveys i.e. how to, measurements points are store in a STAR central repository

Does the proposed way forward fit with the new STAR software and schedule for having this available.

Findings:

There is a strong interest to be able to utilize the STV/VMC in order to investigate misalignment before the detector system is taken data.

Comment:

From the discussion it is uncertain that the current develop time table from STAR computing matches the requirements/wishes from the HFT group.

Recommendation:

There has to be simulations that include distortions to study the effect of mis-alignment. What is the influence of separate alignment parameters? This may have to be done with a prototype of the STV/VMC within 6 months.

It will be desirable to have this available on a 4-month time-scale and will have to involve HFT people to participate in development effort. **This should be discussed with the STAR-computing group.**

Review the proposed manpower and schedule for getting this together for analysis of engineering run data, and for run-14 data.

Findings:

Overview of manpower needed for both on-project tasks of off-protect task (offline) was presented in Spiros' overview. There are currently identified resources for PXL in this, while the IST and SSD is uncertain at this point.

Comments:

The most important task for the upcoming run-13 is the survey, and calibration database and methods for the PXL. If the effort on this can be maintained for the next 4-6 month, it seems quite feasible that survey, and DBs software can be in place for the simulations and engineering run.

Recommendations:

The HFT group should identify resources for IST and PXL survey efforts. There is still time to do this; the UIC group is getting involved in IST. SSD was previously integrated into STAR so possibly existing methods can be incorporated. It should be reviewed how much can be reused. This should be addressed in the upcoming scheduled review for the fall.