

STAR Forward Tracking Update

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- Akio's page → <https://www.star.bnl.gov/protected/spin/akio/fcs/index.html#2026>
- "Planar Mode" fixes, DB based geometry & Initial rough alignment of STGC
→ <https://www.star.bnl.gov/protected/spin/akio/fcs/FstFttFlipTest/index.html#spacepoints>
- Collection of links/files for mapping & survey → <https://www.star.bnl.gov/protected/spin/akio/fcs/survey/>
- Computing/Production team wants to start ~10% Run23 AuAu production this week, which will take 1 and ½ month (~mid Nov)
 - Most of Fwd Software updates won't make it
 - Most of Fwd Software fixes can be applied at Afterburner
 - Only one thing I know of which cannot be recovered at Afterburner is "FST same PHI, skipping R clustering"
<https://www.star.bnl.gov/protected/spin/akio/fcs/FstSlowSim/fstclus/index.html>
 - There is BFC option "fstMuRawHit" which seems to work, but there is no reader (?)
 - Only 0.8~2.5 kB/event or 0.5~1.6% of the MuDst to keep Fst RawHits
 - It works and reads back ok
 - Updating StFstClusterMaker to read fstMuRawHit to re-run clustering – works
 - 1 line bug (local phi int → float) in StFstHitMaker.cxx:104 shifting $\sim 15^\circ$ multi phi strip clusters position by up to ½ strip width
- Gitea Transition is done. Strategy for PRs?

Planar Mode, Geometry XML and Misalign Tables

<https://www.star.bnl.gov/protected/spin/akio/fcs/FstFttFlipTest/index.html#spacepoints>

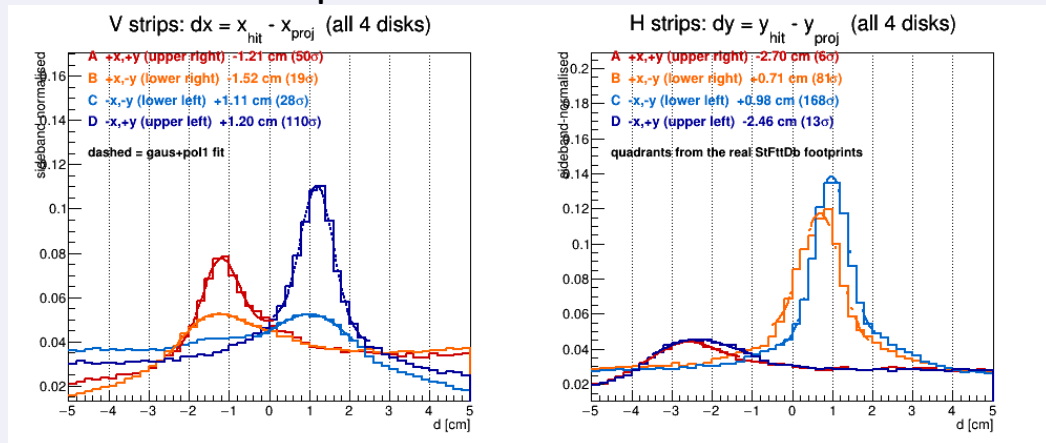
- Flemming's FST XML Geometry update → shifted Z locations (~3cm)
- STGC geometry file : INT → FLOAT z position
- NO FST wedge flip in phi & NO STGC V/H flip
- "misalign" tables for both FST and FTT(stGC)
 - For now, we use ./StarDb/Geometry/fst/*.C and ./StarDb/Geometry/stgc/*.C (need to rename to stgc → ftt)
 - Requested to create Geometry/ftt/<3 geometry tables> in offline DB. Eventually we should push .C to DB
 - New "build_geom_misalign.C" to create fGeom.<GeomTag>.misalign1.<Date & Time>.root
 - We need to link correct fGeom.<GeomTag>.misalign1.<Date & Time>.root file as fGeom.root
 - Waiting for final geometry Tag from Jason Planar Mode
 - I propose to use these misalign tables as (at least, for the final) misalignment data format (even for iterations...rebuild takes only ~30sec)
https://www.star.bnl.gov/protected/spin/akio/fcs/FstFttFlipTest/Xihe_suggestions.txt
- Fwd Tracking code : "kSpacePointMode" = false = "Planar Mode"
 - Make EPD (and FCS) hits fall back to "space point" (planar mode only for FST and FTT)
 - Geometry local to global based on AGML/fGeom.root
 - Missing kFstzFilp[disk] → Disk=1 was flipped → Read from AGML/fGeom.root
 - No FST 1 degree gap → read from the sensor shape's Phi1/Phi2
 - Fix FST sensor → FTUS map
 - Fix for Flemming geometry is now using "S" (simplified) version which has different geometry hierarchy
 - AGML and StFttDb quadrant order differ!
 - StFttDb has survey "Z" for each quad while AGML has only for quad-A → Put them in misalign table
 - Make StFttDb to ignore hardcoded xyz offsets and pick them up from DB by default (with a switch to fall back using hardcoded numbers)
 - I propose SpacePointMode=false as default, and keep SpacePointMode for debugging as Daniel intended
- Remaining issues with "SpacePointMode" → https://www.star.bnl.gov/protected/spin/akio/fcs/FstFttFlipTest/proposal_spacepointmode_fix.txt

First very rough STGC alignments in “misalign” table

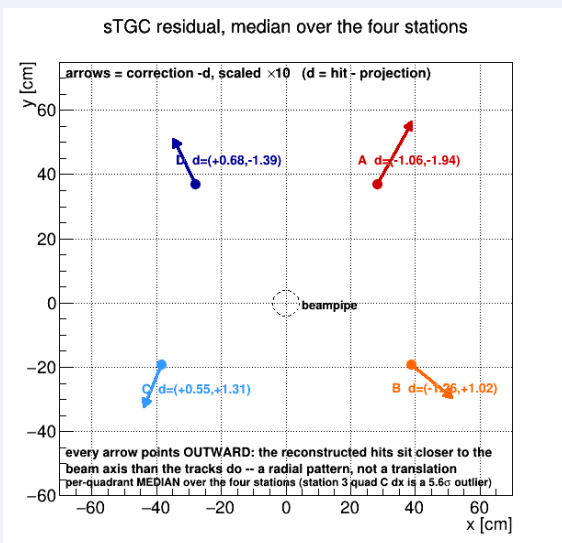
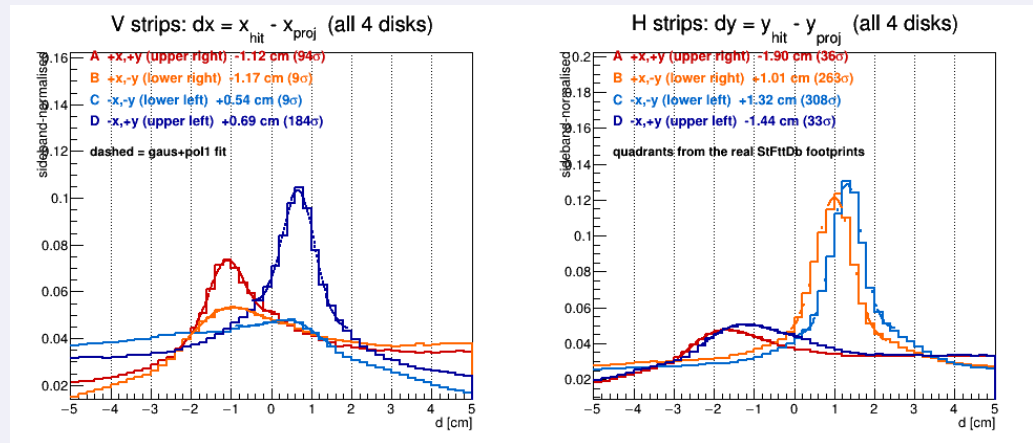
https://www.star.bnl.gov/protected/spin/akio/fcs/FstFttFlipTest/index.html#tables_in

ZF data FTT residuals from FST + TPC vertex tracks with Planar Mode fixes, Flemming’s Geometry, new fGeom.root with “misalign” tables, DB based StFttDb

Space Point Mode



Planar Mode with fixes



Planar Mode + Flemming’s Geo + 1st misalign table + StFttDb update

