Status / Plans 2019/2021 SVT Alignment

Cameron, PF

07/01/2020
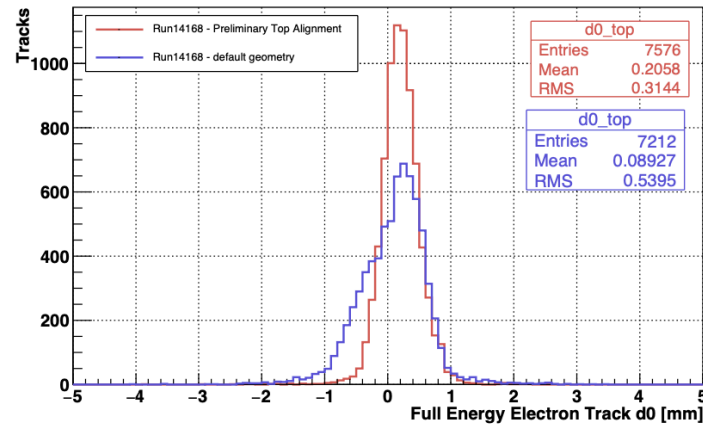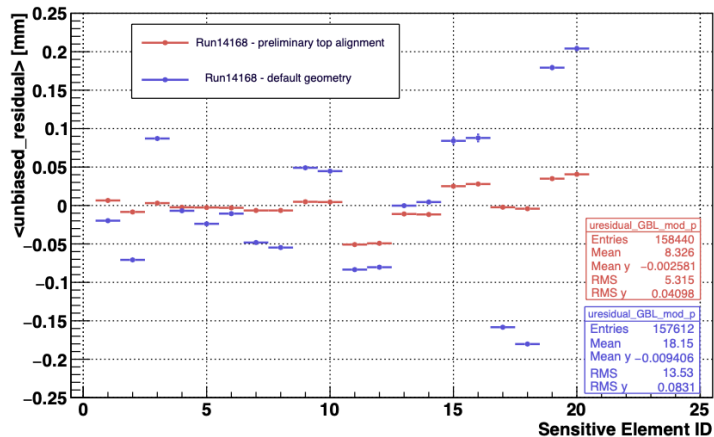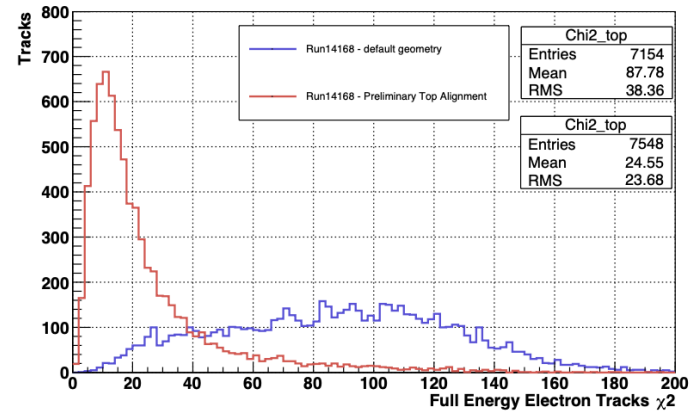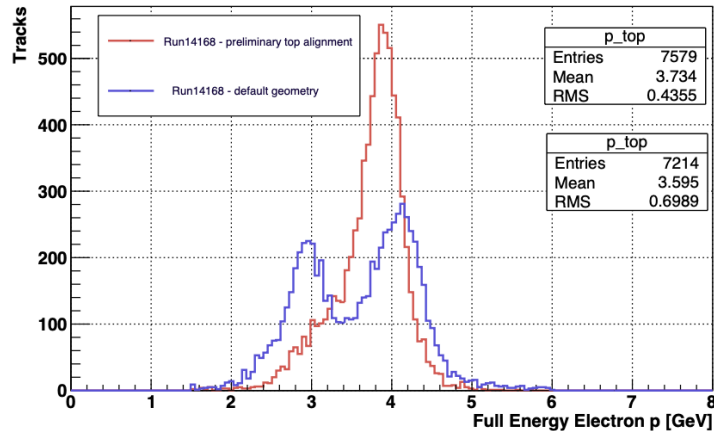
Status and Plans

- Cameron (mostly) and I resumed the work on 2019 and 2021 alignment
- Cameron picked up my current framework and ran over 2021 FEE samples
- Current 2021 alignment status:

Status and Plans

- Top Alignment corrections in place:
  - Ty / Rx of the Front UChannel
  - Ty of the front and back layers (all 7 layers)
  - Tx of the back layers (3 layers)
    - **This to be revisited**
  - Tu of all the front 8 sensors

- We see this provides a good momentum reconstruction and good performance of the residuals
- I did a careful check of the corrections and in particular some of the Tx corrections of the back layers seem un-physical:
  - It's possible to obtain the same performance using only the Tu corrections of the stereo angles with smaller movements
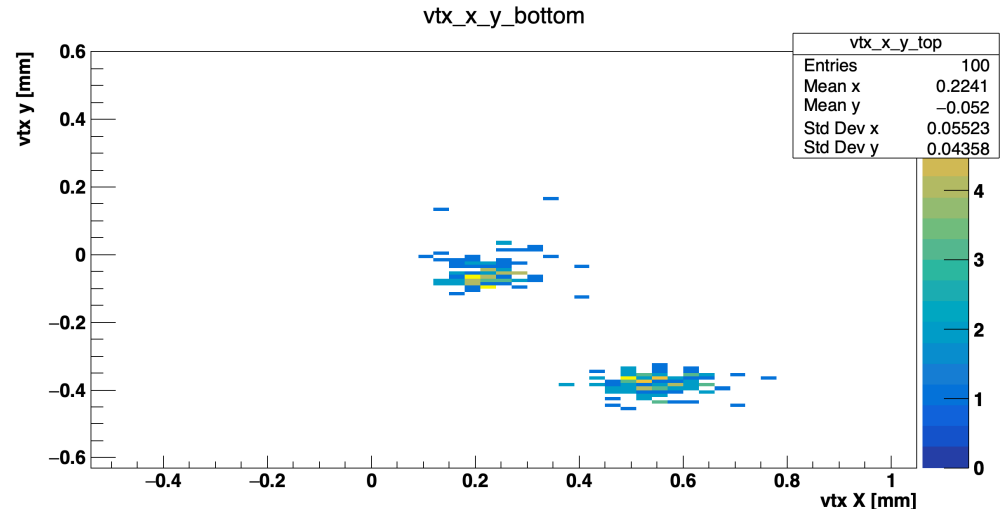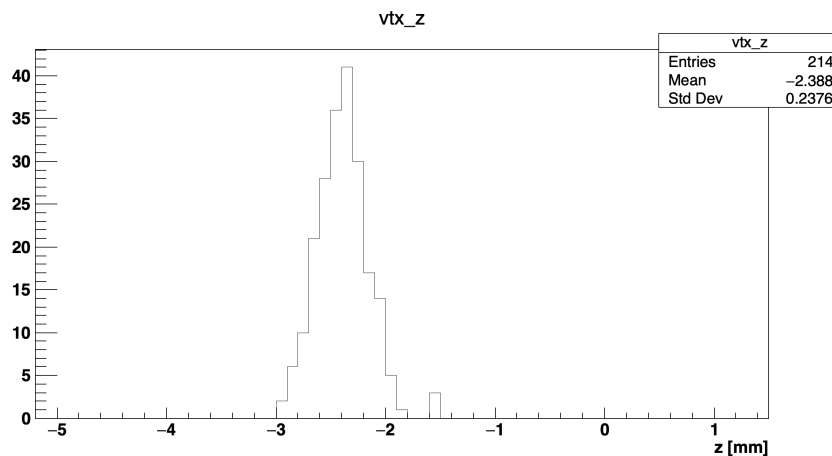
Status and Plans

- Bottom volume has a poor momentum distribution
- We investigated the effects of global UChannel corrections as well as single stereo sensor corrections in the back of the detector
  - Observed a large (unphysical) correction due to Ry which fixed the momentum O(4.4mm)
  - Cam could reproduce the same fix using single stereo sensors in the back => will apply those as starting point
- Will use FEEs with momentum constraint to improve the back of the detector aligning Tu of single sensors / double sensors.

p_bottom

p_bottom	
Entries	4131
Mean	5.051
Std Dev	0.7714

p [GeV]

4
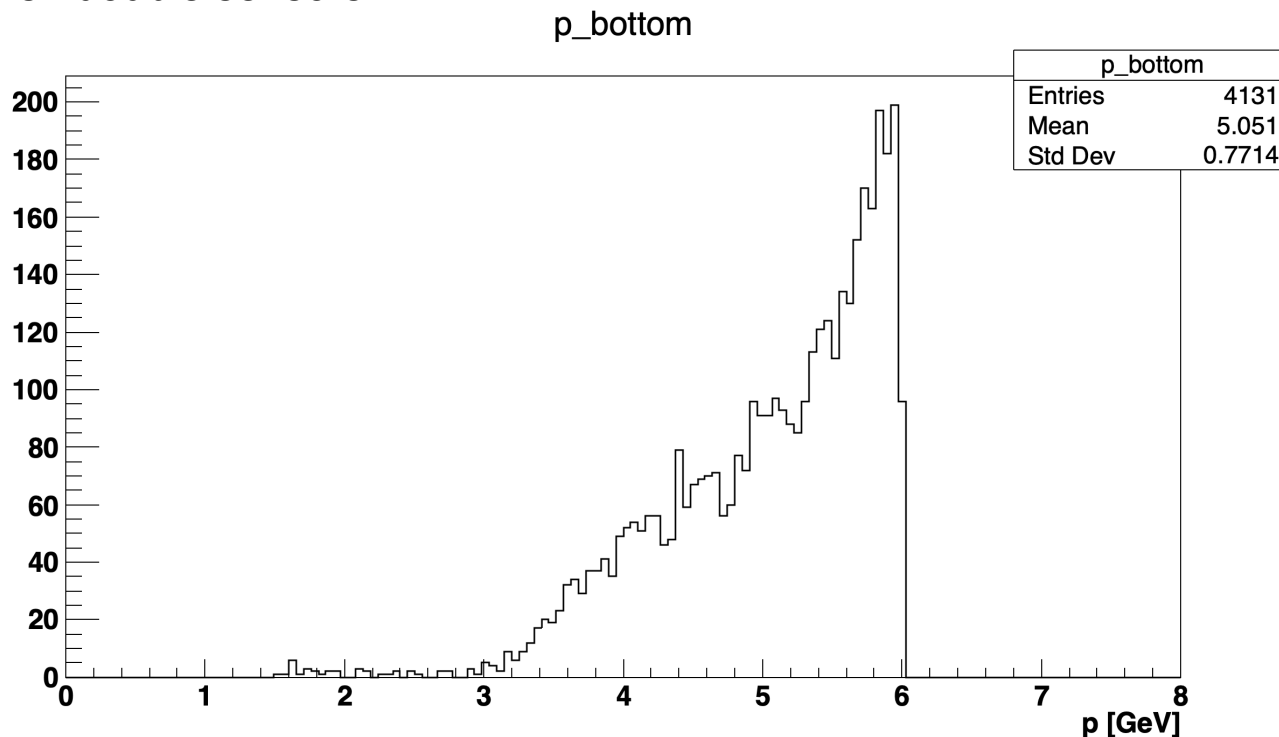
Status and Plans

- The Z distribution of the vtx seems to be closer to 0 wrt 2019.
- Would benefit of the analysis using the wires as target (volunteers for analyzing that data?)
- Top Y vtx distribution closer to where expected from wire scans
- Bottom 400um off => Plan to use 0,0 @ -1mm as initial BS constraint for correct front of the detector

Status and Plans

- Work on re-aligning the detector resumed
- Had limited time to work on that in the past months (and will have limited time in the next 3 weeks)
- Plan is to split the work between me and Cam on 2019/2021
- Cam shown that the machinery can be used by other people as well
  - Jump in if you'd like to help with the service task
  - Would benefit of estimate of the Z position of the target from wire scan analysis
  - Would benefit of some help for running monitoring /.analysis on the results produced.