INTT Weekly Meeting (mm/dd/yyyy)

Joseph Bertaux

July 20, 2023

Resovled *strip_x*, *strip_y* issue

Fixed the `strip_x`, `strip_y` issue Takashi pointed out

- ▶ Checked with the tracking group that this was correct (it is)
- ▶ The code is used according to:

    ```
    TrkrDefs::hitkey hitkey = InttDefs::genHitKey(vzbin[i1], vybin[i1]);
    ```

    (see here)

- ▶ Their `vzbin` is analogous to what I've called `strip_y`, since `strip_y` is measuring in the $+z$ direction.
- ▶ Here's the corresponding line in the Decoder, which can be found here:

    ```
    hit_key = InttDefs::genHitKey(offline.strip_y, offline.strip_x);
    ```

The PR that fixed this has been merged and this should be fixed.

Finished analyzing survey data

- I've completed my analysis of the survey data
- All codes and files can be found in a subdirectory of the INTT Github Repository
  - Met with tracking group yesterday
  - emailed the key file, `dat/transforms.txt` to the tracking group list
  - INTT mailing list was cc'd
- Feel free to reach out with questions or comments
- It still needs to be checked and deubgged
  - May need to make a custom event display (a reference was provided here)
  - I've already noticed one potential problem in the mapping

Finished analyzing survey data

An example of the first several lines of `dat/transforms.txt`:

```
hitsetkey       alpha        beta       gamma           x            y            z
16983552     -0.26253    +0.00110    -0.00059    -21.27081    -75.85949    -70.28777
16999936     -0.26384    +0.00110    -0.00090    -21.46096    -75.90736   -186.45825
17016320     -0.26068    +0.00089    -0.00081    -21.09835    -75.76660    +60.76268
17032704     -0.26244    +0.00093    -0.00038    -20.93735    -75.73496   +176.94476
16982528     -0.78478    +0.00077    +0.00033    -54.99117    -56.22769    -70.25475
16998912     -0.78815    +0.00048    -0.00179    -55.11142    -56.18837   -186.41177
17015296     -0.78370    +0.00022    -0.00023    -54.93090    -56.24875    +60.85369
17031680     -0.78374    +0.00037    +0.00045    -54.88777    -56.29958   +177.04160
16981504     -1.30229    +0.00030    +0.00063    -74.29693    -22.51740    -70.38355
16997888     -1.30314    +0.00031    -0.00058    -74.28391    -22.54561   -186.54303
17014272     -1.30448    +0.00013    -0.00053    -74.28084    -22.47108    +60.73021
17030656     -1.30672    +0.00010    -0.00023    -74.27625    -22.43234   +176.90217
16980480     +1.31524    -0.00049    +0.00070    -74.27946    +16.66439    -70.22052
16996864     +1.31438    -0.00048    -0.00052    -74.27526    +16.63011   -186.38000
```

- ▶ The hiksetkeys are generated directly using the libraries available on sdcc
- ▶ Units are
  - ▶ rad for angles (`alpha`, `beta`, `gamma`)
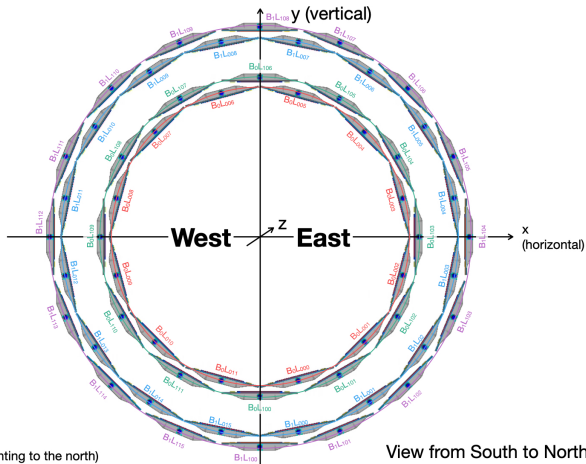 - ▶ mm for displacements (`x`, `y`, `z`)

Ladder Mapping Convention

I noticed a reference image I was using should be mirrored:

Notation: B_xL_{yzz}
   x: Barrel ID (0 for inner or 1 for outer)
   y: Layer ID (0 for inner or 1 for outer)
   zz: Ladder ID (from 0 to 15)

Axis
   x-axis: $\vec{y} \times \vec{z}$
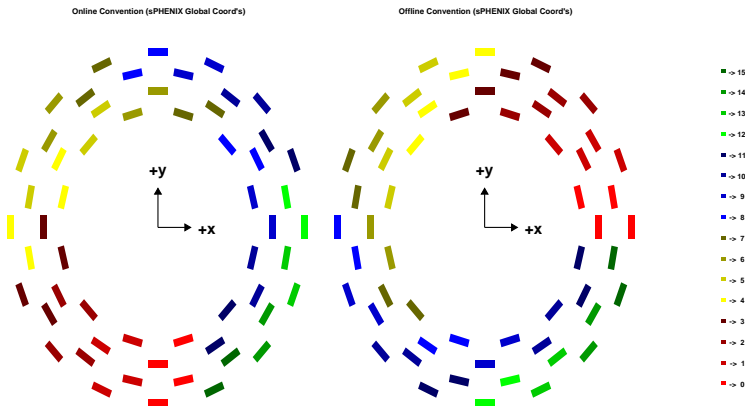   y-axis: Vertically upward direction
   z-axis: The blue beam direction (pointing to the north)

View from South to North

Ladder mapping convention

- If the z axis points into the page, then the x axis actually points to the the left
- This means the online-offline conversion is wrong
- I noticed this before sending the survey data and implemented a fix

Current State of the mapping

Here is an attempted juxtaposition of our online convention of ladder naming vs the tracking groups

Current State of the mapping

- The Offline convention is on the right and it is correct in absolute space
- the Offline index is converted to our Online convention and redrawn on the left
  - In the same position
  - Recolored using the Online ladder index
- You'll notice B0L0 and B1L0 are wrong; they need to be rotated and extra position clockwise
- This was the state of the mapping when the hitsetkeys were generated
- I will need to fix this and resend to the tracking group

Future Work

Tasks I have identified for myself, in the order I intend to prioritize them:

1. Prepare Tracking detector presentation for early August meeting
   - I will likely need help soliciting figures and information
   - As well as feedback on the current state (I don't have a draft ready yet)
2. Return to BNL 7/29 to 8/10
3. Continue debugging survey and mapping conventions
4. Work on Online Monitoring
   - Check by loading evt files offline
   - Implement Jaein's hot channel classification scheme
5. Updated Decoders when pooling becomes available