

The Spin Database

Spinfest 2011
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2. What is in there, in the spin database?

- Most stuff 120 element arrays (for 120 crossings)
 - `spinpatternblue`, `spinpatternyellow`, at IP12 (not PHENIX)
 - `polarblue`, `polaryellow` (even though there is just 1 # per fill in blue and yellow)
 - uncertainties for polarizations also
 - GL1p scalers `bbcvertexcut`, `bbcwithoutcut`, `zdcnarrow`, `zdcwide` (be careful, because these names usually don't match the actual inputs for a given Run)
- Other stuff
 - `crossingshift`
 - `runnumber`
 - `fillnumber`
 - `qa_level`

3. Where does that data come from?

- **spinpatternblue**, etc.: data from CAD on what directions the beams are polarized in
- **polarblue**, etc: online (pC) number eventually replaced by # offline analysis of CNI polarimeter data
- **bbcvertexcut**, etc (GL1p scalers): counted by scaler boards
- **crossingshift**: correction for **spinpatternblue**, etc., **already applied to these if calibration is done!**
- **qa_level**: input by expert who is filling the DB to separate different revisions
- Be careful! No shift given for **bbcvertexcut**, etc.

4. Online Calibration procedure

- Process some small # events online
 - Each event has
 - a crossing id (what IT thinks its crossing id is!)
 - a spin pattern (more or less. data from V124s corresponding to what spin pattern was actually being delivered when the event was taken.)
 - trigger bits fired (bits fired when the event was taken.)
- We also know what the spin pattern should look like across all crossings, with abort gap, etc, in the usual place (from CDEV information)
- So there are two ways to calibrate the data
 1. Make the event (V124) spin pattern vs. crossing id line up with the intended (CDEV) spin pattern vs. crossing id
 2. Make low spots (few triggers) in the trigger distribution vs. crossing id line up with "unfilled" bunches in the intended spin pattern (CDEV) vs. crossing id
- Either is equivalent to a crossing id shift in the event data

5. Online Calibration Code location

- If you want to look at it, the locations in CVS are
 - `online/calibration/onlcal/subsystems/xingshift/`
 - `offline/packages/xingshift/`

6. What about GL1p scaler data?

- So what about the GL1p scaler data (bbcvertexcut, etc.) in the database, with no crossing shift?
 - GL1p scaler data is counted in step with other event data, so it should have the *same shift*
 - in other words, shift calculated for spin patterns should also be applied to GL1p scaler counts.
- In practice, we do an online calibration to get the crossing shift, and apply that to the spin pattern immediately
 - then later, or by the analyzer, that shift is also applied to the GL1p scaler counts
- Some offline work done to make sure online calibration worked correctly

7. How to access the DB?

- You can access the spin database information in at least two ways:
 1. use database commands. e.g. on rcf try
 - `psql spin_phnxdbrcf2_A`
 - `\d spin`
 - `select spinpatternblue, bbcvertexcut from spin where runnumber=286636;`
 1. Use library "libuspin" (at <offline/packages/uspin/>)
 - much easier, can use easily in your own code
- For Run11 (i.e. recent runs), it may be necessary to go to `spin_oncal` or `spin_daq` tables to get data
 - and maybe also use a different `qa_level`

8. Example code snippet with libuspinn

- full snippet at <https://www.phenix.bnl.gov/WWW/p/draft/manion/spinDBexample/>
- Important lines:
 - SpinDBOutput `spin_out("phnxrc");`
SpinDBContent `spin_cont;`
 - your objects
 - `spin_out.StoreDBContent(runnumber,runnumber);`
 - gets information from the DB
 - `spin_out.GetDBContentStore(spin_cont,runnumber)`
 - stores DB information in your `spin_cont` object
 - `spin_cont.GetSpinPatternBlue(i_cross);`
 - and similar commands for all other DB information you might need

9. Running the example (I encourage you to try it)

```
root [0] gSystem->Load("libusp.in.so");
root [1] .L
/direct/phenix+WWW/p/draft/manion/spinDBexample/libusp.in
ippet.C
root [2] snippet(286636);
Retrieved spin content from DB.
fillnumber is: 10806
spin blue, spin yellow of crossing 7 are: -1, -1
GL1p scaler counts for crossing 7 are: 4626136, 276007550,
35978, 1328848
end of example
root [3]
```

10. The End