TOF Software Progress

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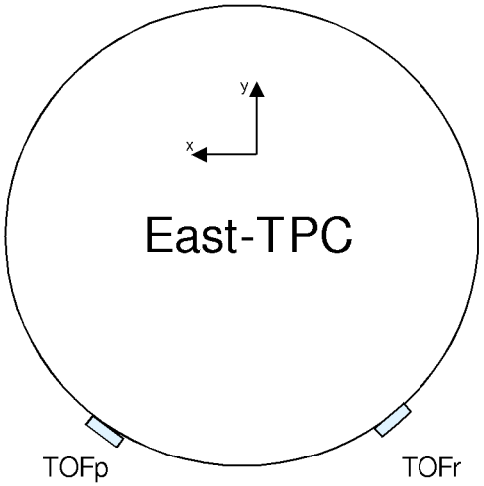
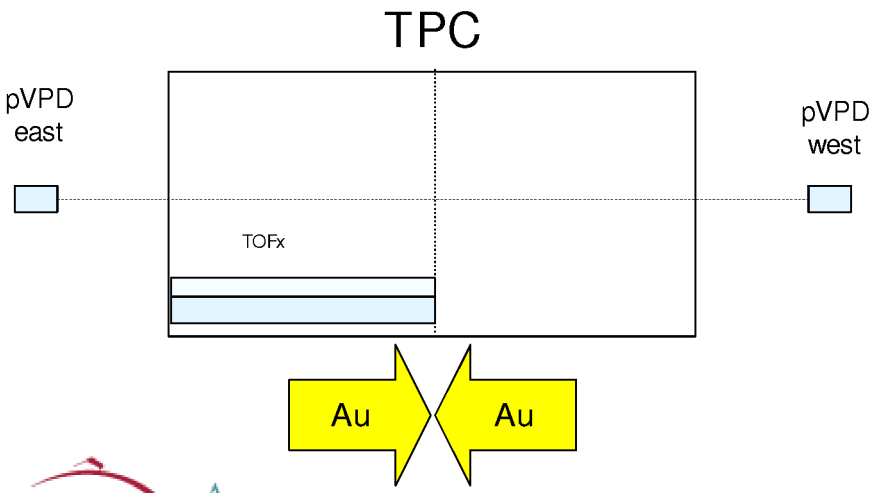
- TOF detectors in Run IV
- Online software
- Offline software
  - -- Data base & Geometry
  - -- Makers
    - match
    - calibration
    - simulation and embedding
    - MuDst
- Summary & Outlook

TOF detectors in Run IV





Some changes this year:

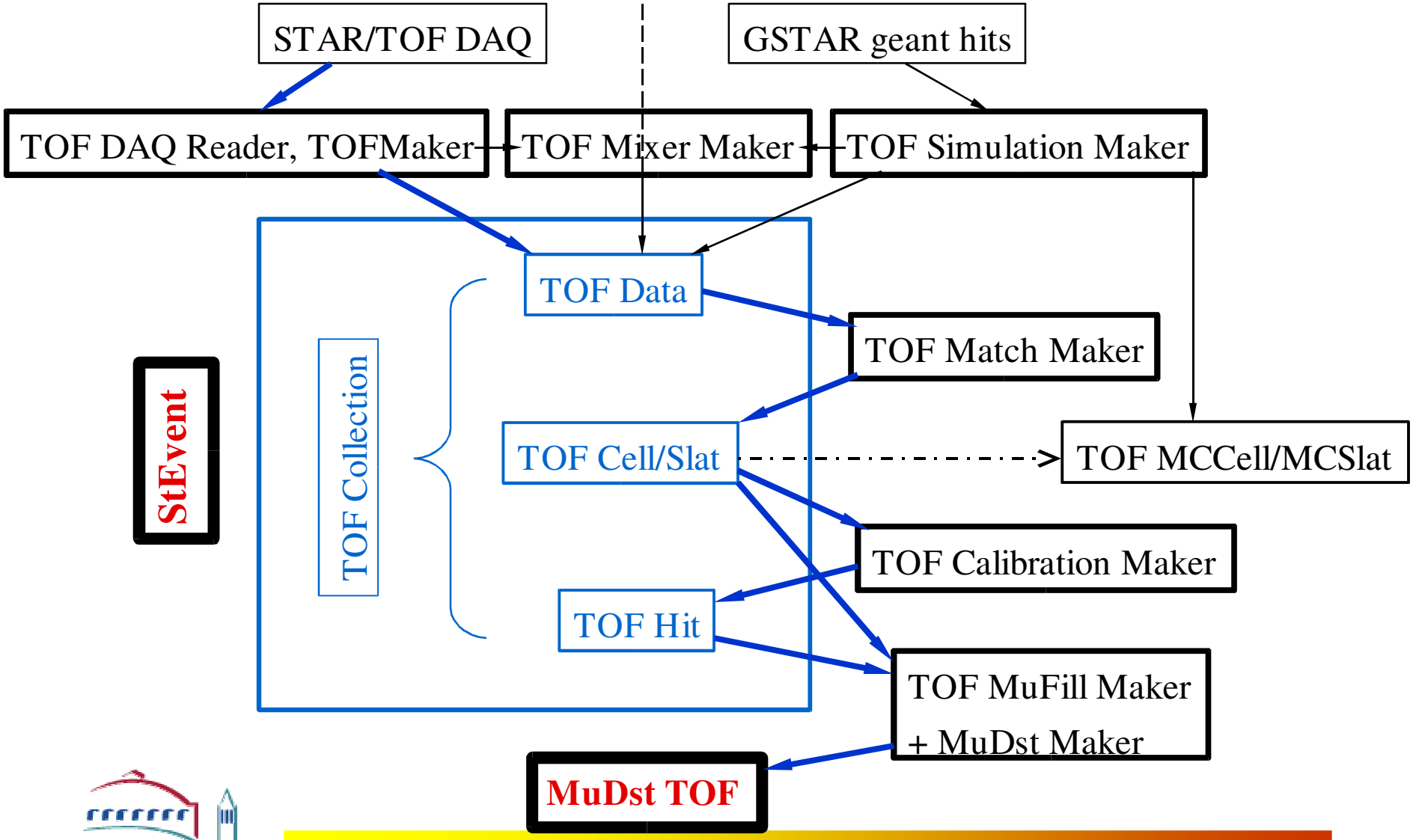
- pVPDs moved ~4" further from Z=0
- TOFp moved one slot clockwise when facing west from the east side
  --- read out channels no change (41)
- TOFr did not move, but the tray size and module positions in the tray changed
  --- First 20 modules (out of 32) in the tray have read-out electronics (72+48 channels totally)

Online Software

- Online software extended to 3 CAMAC crates in order to accommodate the read-out of 48 additional TOFr channels.
- new TOF raw data format (41+72+48 channels) required similar changes to the offline DAQ reader.
- Clearly we still have issues with the TCD-Bira communications which show up in TOF DAQ.
  --- mostly due to a hardware problem, not a software problem

-- TOFr HV is now only one channel. Software was updated accordingly and so was its interface with SlowControls.
-- TOFp HV. No changes, only updated the Cell Mapping for its SlowControl interface
-- TOFr Gas. No changes.
-- SlowControls interfaces. Reviewed the Red/Yellow alarm settings and made them available as a document

TOF Offline Software Framework



TOF geometry & dbase

TOF Geometry

- Find the tracked cell/slat from a Helix
- Coordinates transferring
- Initialization from GEANT

GEANT definition change due to the geometry & position change this year

Data Base

Many new introduced structures

- TOF configurations --- ready
  - *--- pVPD configuration*
  - *--- pVPD Strobe events configuration*
  - *--- tof detectors configuration*
  - *--- tof Tray configuration*
  - *--- tof Module configuration*
- DAQ mapping --- ready
  - *--- tof DAQ mapping*
- Calibration parameters --- ongoing
  - *--- tof T0 (timing offset)*
  - *--- tof Correction (overall)*
  - *--- tof Correction (each channel)*
- Simulation parameters --- ready
  - *--- MRPC simulation parameters*
- TOFp Geometry
  - *--- need to be updated this year*

TOF Collection in StEvent

TOF Data:

Raw ADC, TDC in each DAQ channel 42 + 6 + 72 (120)

TOF Cell/Slat:

Cells/Slats with track matched

Cell/Slat Id, ADC, TDC, associated tracks, projected position

MCCell/MCSlat: Additional MC information

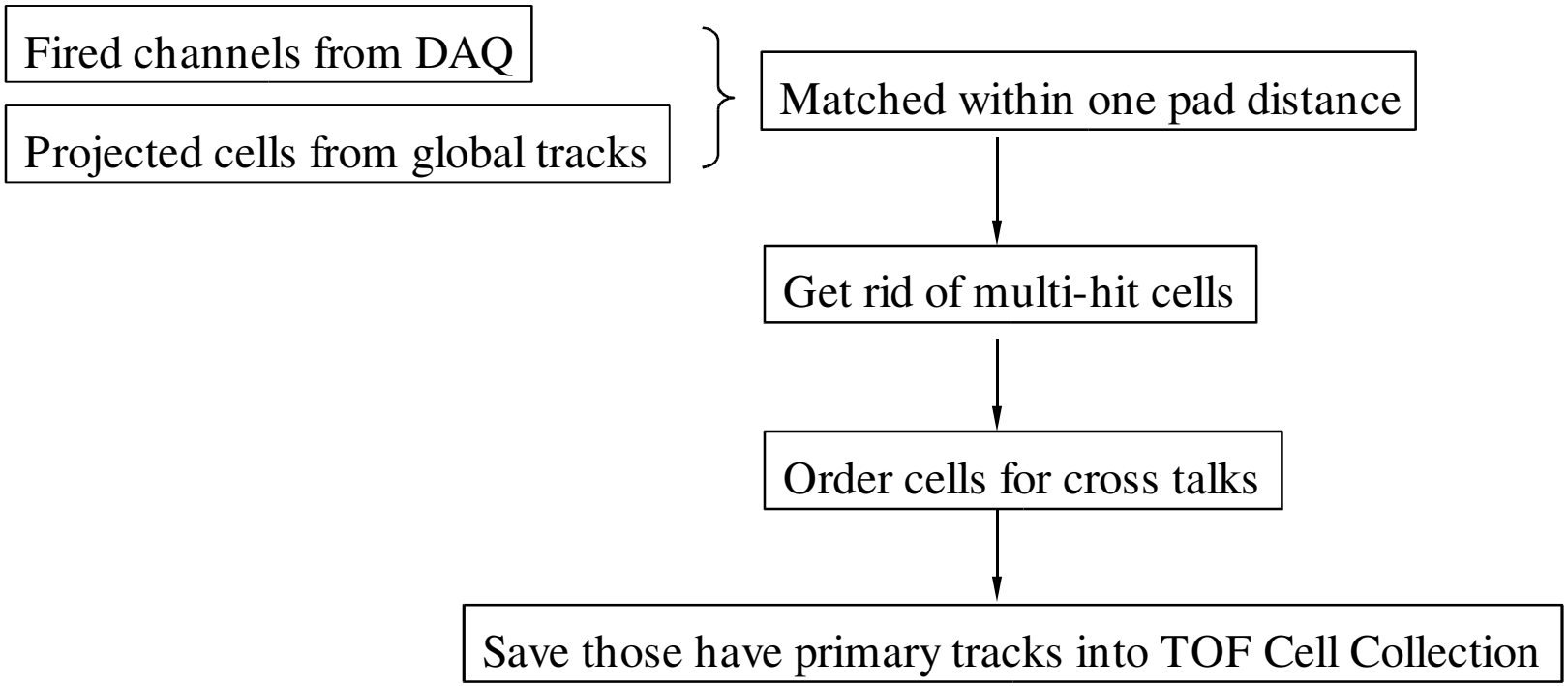
TOF Hit:

After calibration

Physical tof, β, pathlength, etc.

Ongoing Makers I

TOF Match Maker:

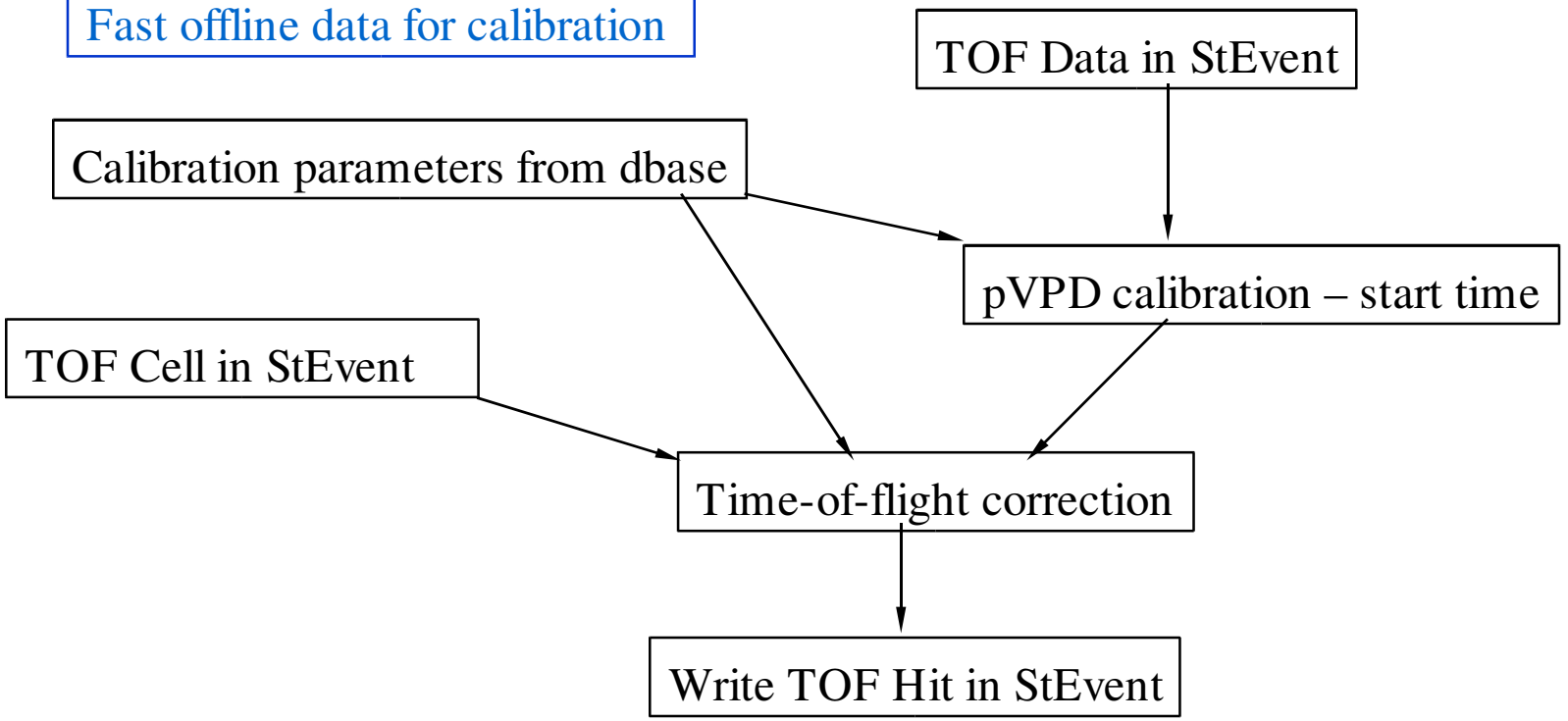


TOFp Match Maker already in library,
TOFr Match Maker ready to be committed

Ongoing Makers II

TOF Calibration Maker:

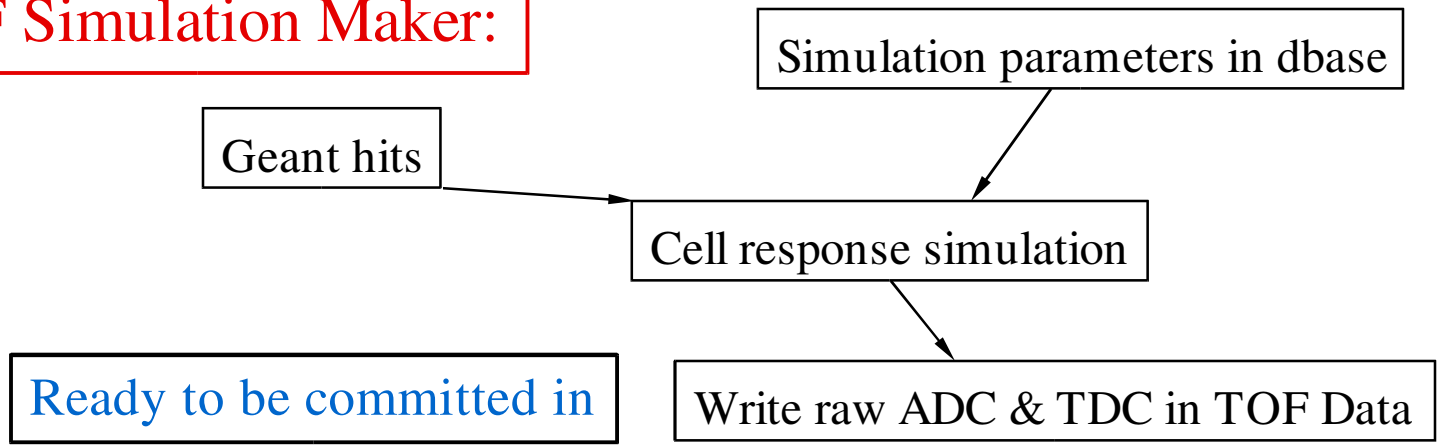
Fast offline data for calibration



Waiting for dbase structure ready to do corresponding change for checking in

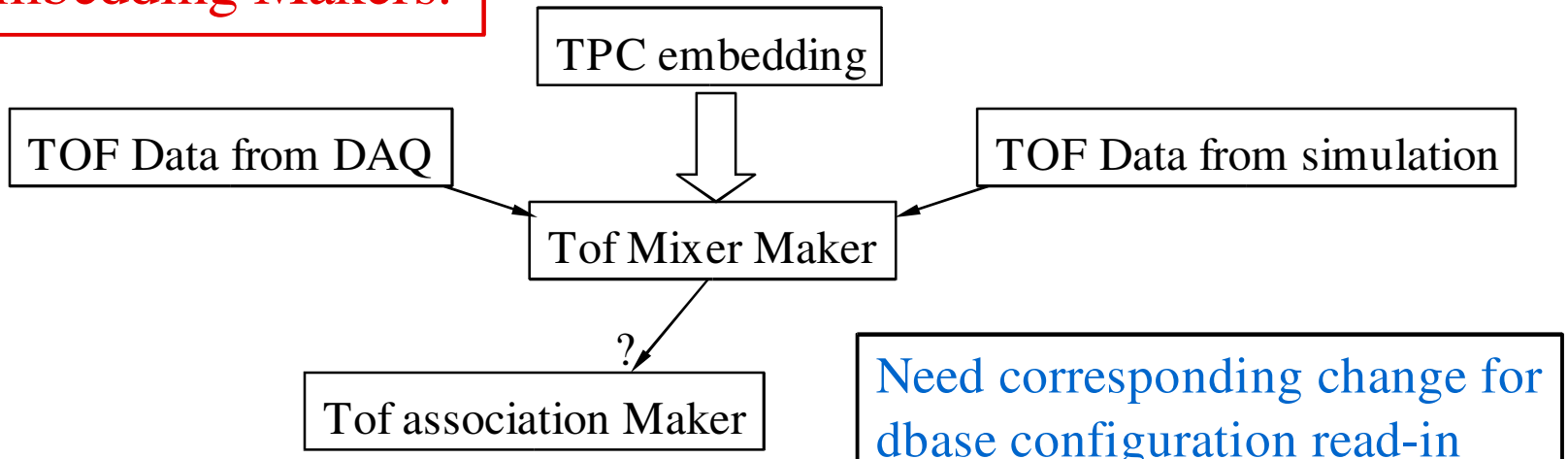
Ongoing Makers III

TOF Simulation Maker:



Ready to be committed in

TOF embedding Makers:

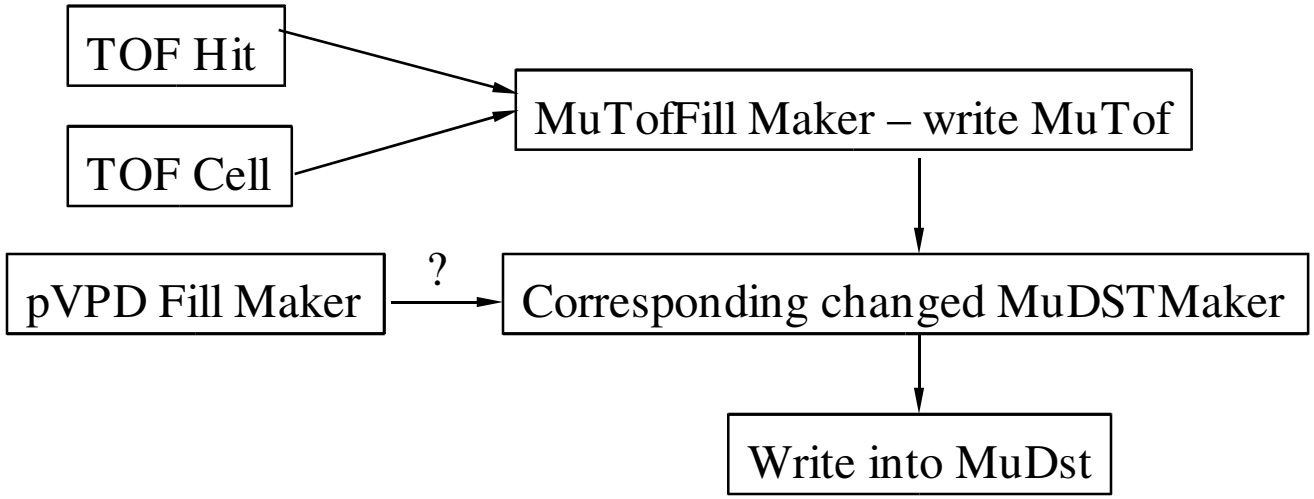


Need corresponding change for dbase configuration read-in

Ongoing Makers IV

TOF in MuDst:

---- MuTof introduced in MuDst



Ready to be reviewed and committed

Makers summary:

- Almost all are ready!
- Need to be committed ASAP before production

Summary

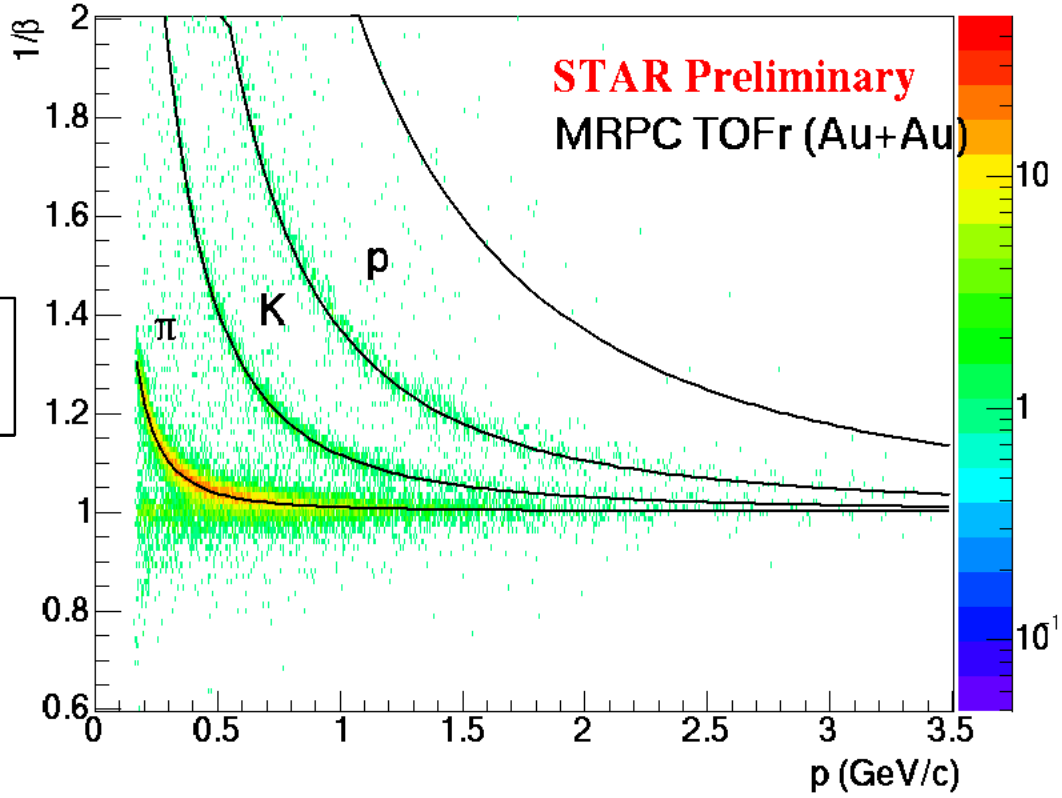
- Online DAQ corresponding change for additional TOFr channels, little changes for other online software
- Geometry changes in GEANT due to the position change of detectors this year
- Many new introduced structures in dbase
  - --- calibration structure on the way
  - --- request corresponding changes for the Makers or Utilities
- Most of the offline Makers are ready to be committed for the coming production

Outlook

Preliminary calibrations for Run IV

Overall slewing correction

Preliminary timing resolution ~120ps



With the development of software, important physics will come out soon!

Great thanks to the Software Group & …helpers!