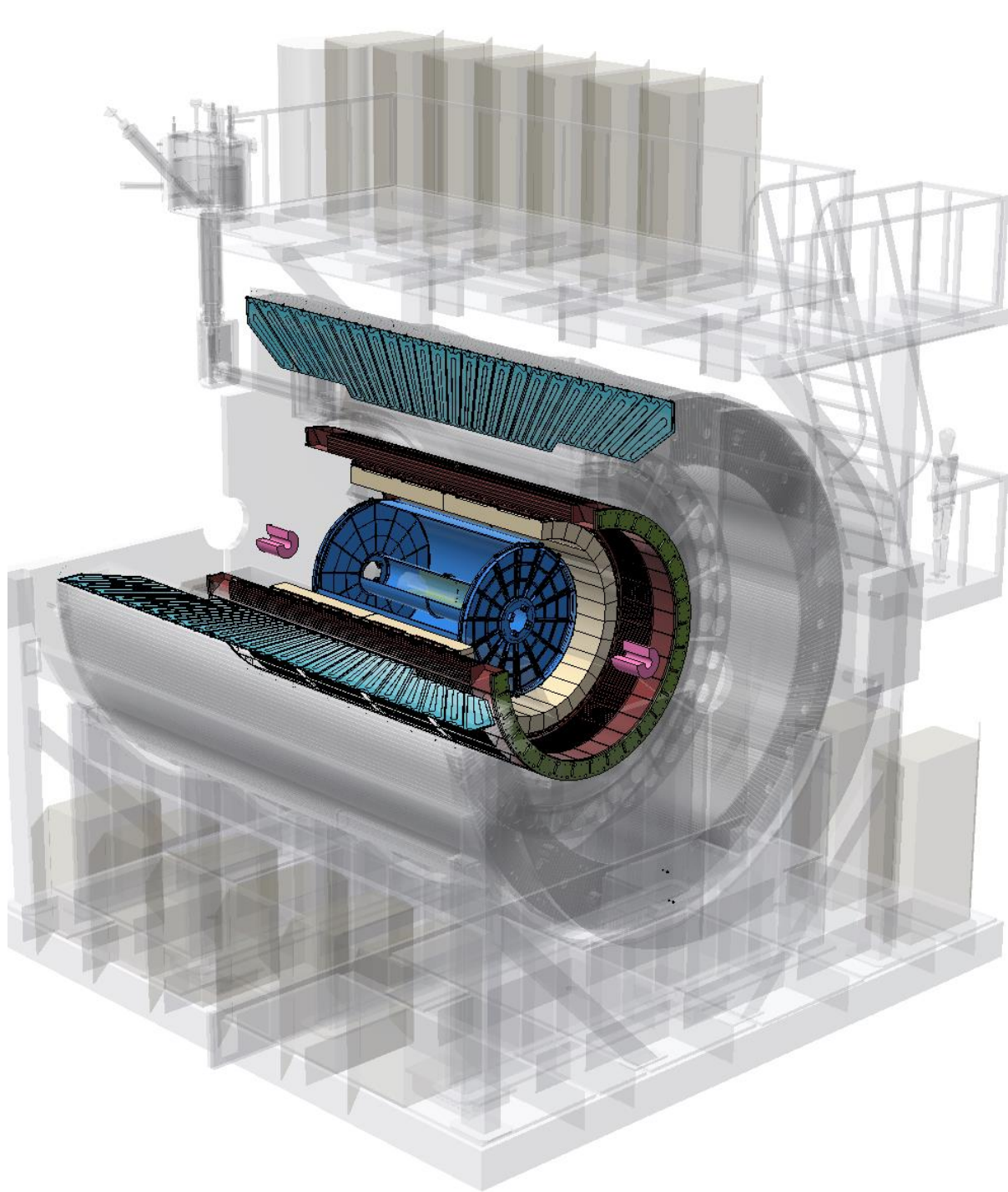


# sPHENIX

Chris Pinkenburg, BNL

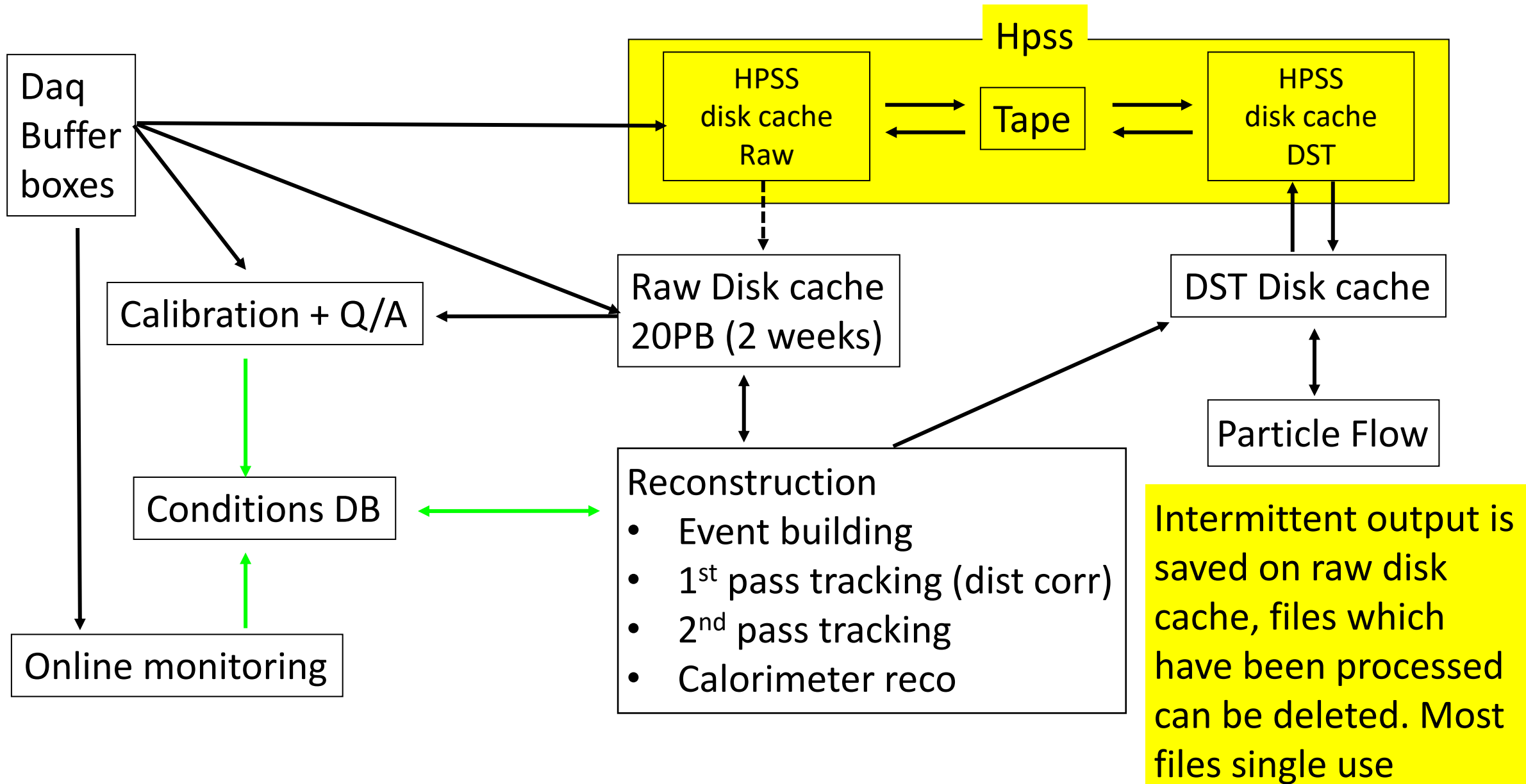


# sPHENIX features

- 15 kHz daq rate
- No online event builder, daq produces ~60 streams along subsystems
  - A fraction of events will be assembled for monitoring/calibration purposes
  - No parallel online event building → Events are time ordered
  - Build only the subsets the production needs (disentangle tracking from calorimeter)
  - Reconstructed output can be combined later (tracks + calo clusters → particle flow)
- Shooting for 24 h jobs, 8 sec/evt → 10,000 events/job
  - <1s worth of data per job
  - Calibrations need some thought – aggregation after processing or dedicated event samples
- Raw data processing done at BNL, Simulation at BNL and outside
  - No cpu allocated for simulations during data taking, any sims during that time have to run offsite

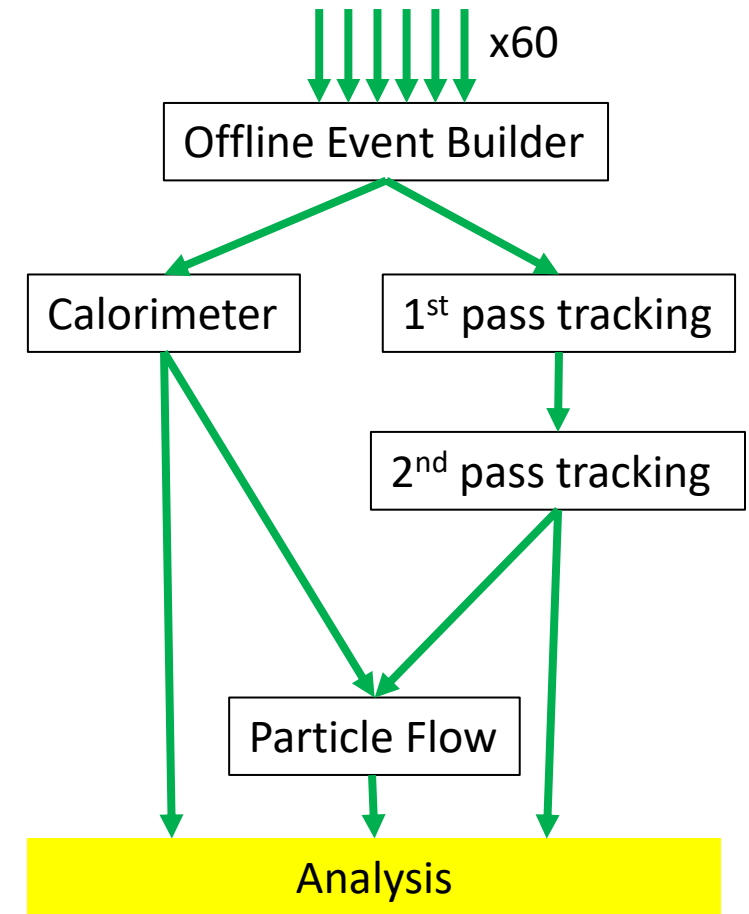
Building events during offline gives us unprecedented flexibility for the production

# Raw Data Reconstruction Scheme (@BNL)



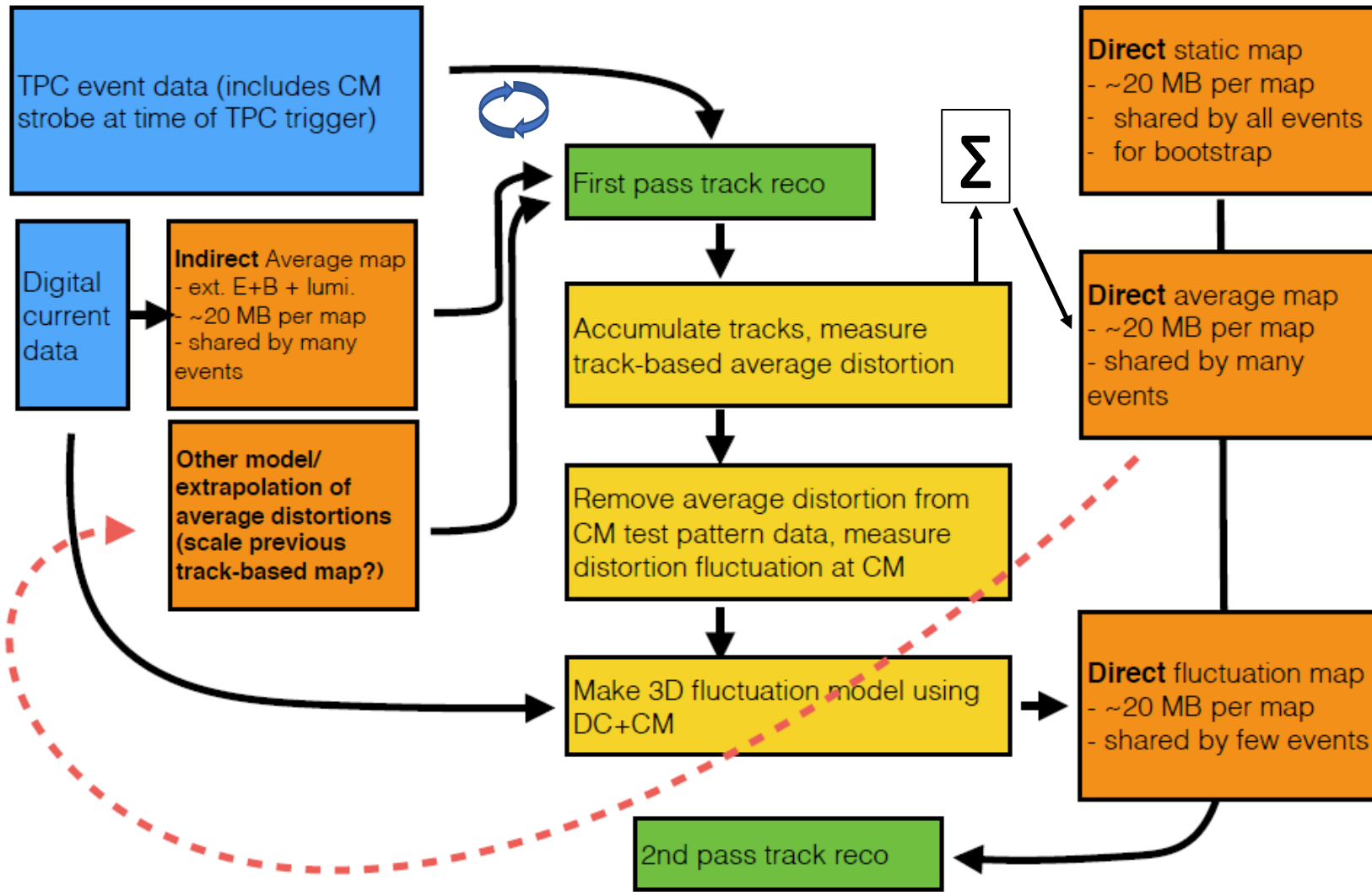
# Recap: Current Production Workflow

1. Event building (60 input streams, 2 output streams)
  - Tracking Detectors
  - Calorimeters
2. Calorimeter
3. 1<sup>st</sup> pass tracking
4. 2<sup>nd</sup> pass tracking
5. Particle Flow (combining tracks and calorimeter data)



Nice and simple – chain them up and run  
(and make sure 200,000 jobs do not step on each other)

# The Challenge – TPC distortion correction



- Luminosity dependent
- Needs 30 minutes of accumulated for average distortions at beginning of fill
  - Afterwards running average
  - Data comes in 1s chunks
  - 24 hour running time
- Might have to redo first pass if initial assumption of distortions is too far off
- Uses digital currents (taken with raw data)
- Not shown – also uses Laser illuminated Al pads on central membrane
- **Digital Current data analysis amenable to GPUs, small data size, fairly significant cpu needed**
  - → run outside BNL?

# Summary

- sPHENIX plans for immediate calibration and reconstruction during data taking
- Offline Event building makes us unique but gives us a lot of flexibility
  - Almost everything is negotiable and can be changed even during running
- Major increase in cpus by the end of this year for sPHENIX
- Mock Data Challenge (MDC) planned for end of this year to exercise this
  - That includes job submission/workflow/data management system(s)
- Needs a PanDa server at BNL, exercising workflow is part of MDC