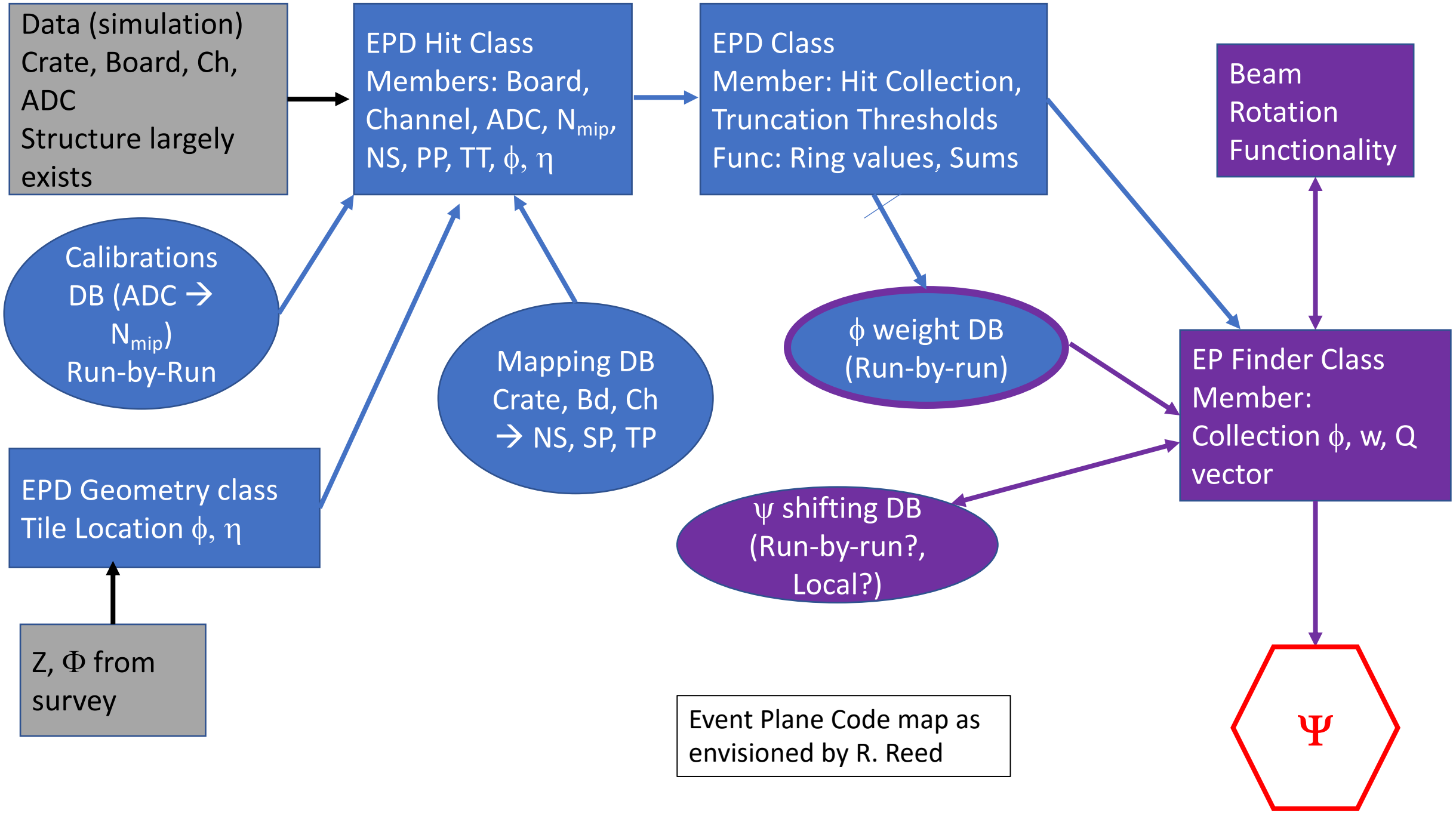

Event Plane Code map as envisioned by R. Reed

Data

- This structure should already exist (everything we're using is the same as the calorimeter)
  - Location within crate, board, channel
  - ADC
- Note: At the beginning of the run we will gain match the channels, improves/simplifies calibration
  - Only requires data

Calibrations DB

- ADC $\leftarrow\rightarrow N_{mip}$
- Should be done run-by-run
  - Temperature variation, etc.
- Will require code to determine ch-by-ch value
  - Fit data with convoluted landau
- Check with the calorimeter group to see what they're doing, this probably already exists

Geometry File

- Records the location of every tile
- Take Z position and F position from survey
  - Updates tile location based on these
- Always in the lab frame

Mapping DB

- Can simply be a file → Maps channels to tiles
  - Though better to time stamp just in case we need to swap things

EPD Hit Class

- Does a large fraction of the software work of the EPD
  - Members: Board, Channel, ADC, Nmip, NS, PP, TT, ϕ, η
  - Structure should exist in produced data file
- Creation always should go by NS, PP, TT
  - Checks Geometry file for ϕ, η
  - Checks Mapping DB to find Board, Channel
  - Checks Data (or simulation) to find ADC
  - Checks Calibration DB for Nmip ←→ ADC conversion
- Everything above this should be agnostic wrt data vs simulation

NS = North or South
PP = Sector Position
TT = Tile Position

EPD Class

- Owns the collection of sEPD hits
- Functions to determine
  - Ring-by-Ring sum hits
  - North vs South sum hits
  - ϕ/tile weighting to fill in DB (run-by-run)
- Applies truncation threshold
  - Determine with a few days of data best value(s) and use in the default constructor
  - Allow analyzer to change, but requires caution
    - ϕ weighting will change → Can people make local DB?

ϕ weighting DB

- This should be somewhat generic
  - Instances by sub-system
- Perhaps general task belongs to bulk/sPHENIX
  - sEPD team can generate our specific DB

ψ weighting DB → Local?

- Specific to analysis → general DB probably won't work
  - Not sure how this works in fun4all framework

EP Finder Class

- This should be as generic as possible for greatest functionality
  - Takes a collection of weights and ϕs
  - Takes appropriate ϕ weighting from DB
  - Feeds weights to ψ DB as necessary
  - Takes appropriate weights from ψ DB as necessary
  - Uses beam rotation/boost
- Calculates nth order Event Plane given input data and specific DB connections
- Should write out ψ in production, can be used to recalculate
- **Beam rotation and boost needs to be a generic fun4all function!!**

Calibration steps for sEPD EP determination

- Gain match tiles
- Run-by-Run Nmip calibration
- Run-by-Run ϕ calibration (require Nmip)
- Ψ shifting determination
- Calculate user friendly EP