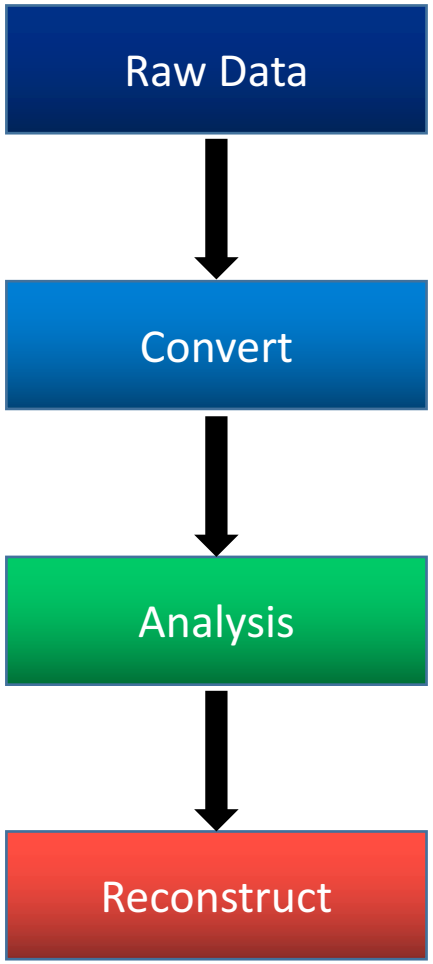
S12 data analysis

code design

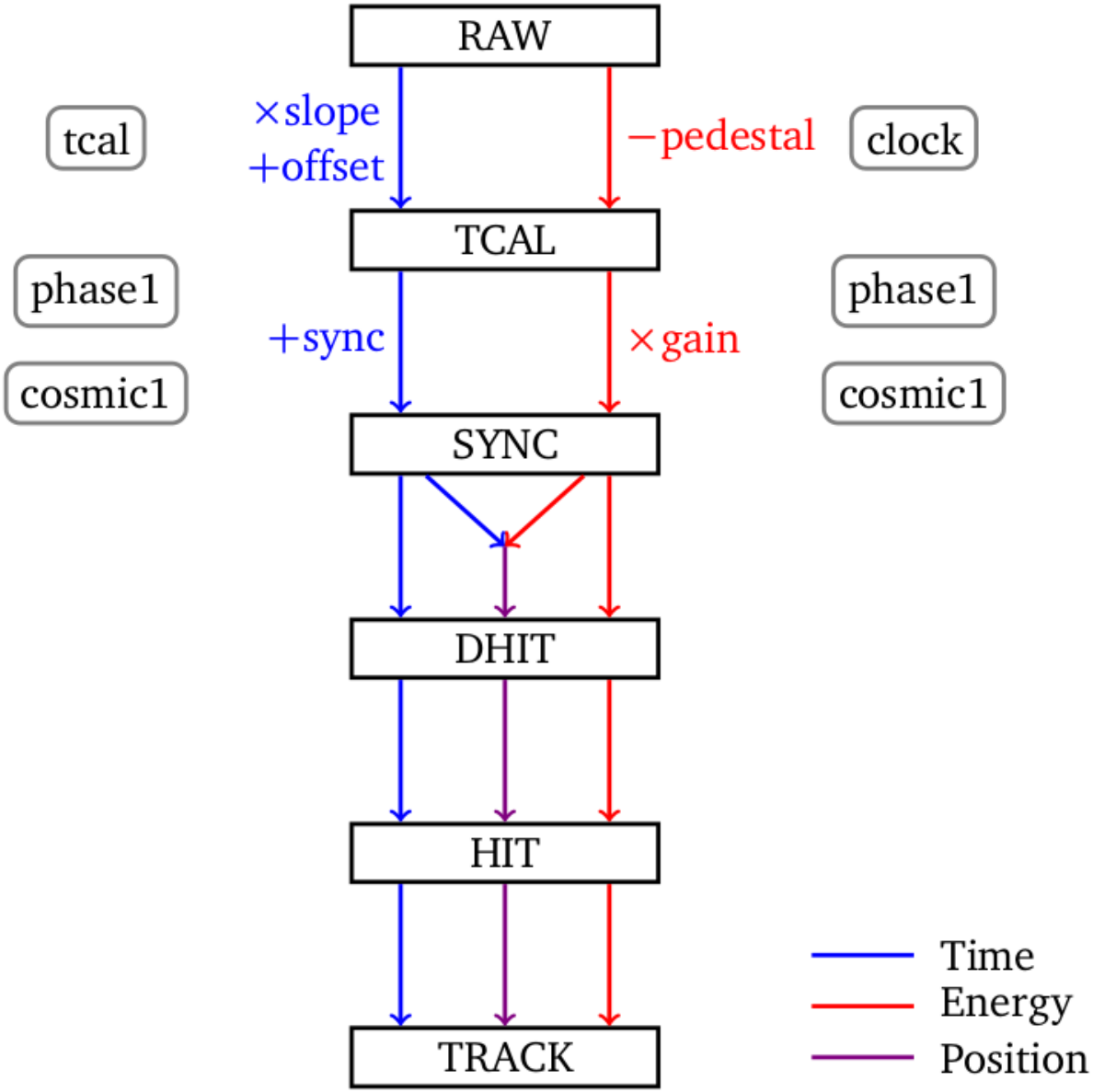


3 Analysis Steps

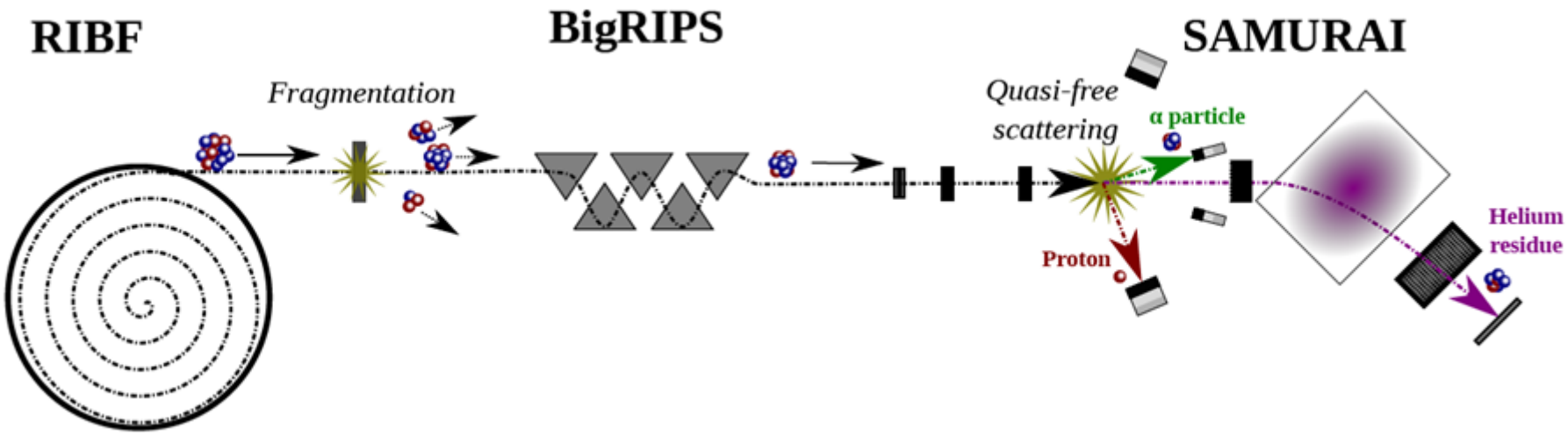
1. Detector Level:
- From Raw Data to Calibrated Detector Output
- Raw ADC Channel into Energy, Time, Position information
- TNewDetector class for each Detector
- Provide enough branches for checking detector performance

2. Experiment Level:
- Physical variables: tof, velocity, target position, beam trajectory etc.
- TNewPhysics class for each variables

3. Event Level:
- TNewEvent class for all information related to an physics event
- *(Energy, Time, Position)* of Beam, Proton, Cluster, He Residue


RAW
×slope
+offset
−pedestal
tcal
clock
TCAL
phase1
phase1
+sync
×gain
cosmic1
cosmic1
SYNC
DHIT
HIT
TRACK
Time
Energy
Position

Experiment Level



Beam Detection : PID, Energy, Trajectory
ToF, Energy: Plastic (F3,F7,SBT)
Trajectory: Drift Chamber (BDC1,BDC2)

Protons Detection : Energy, Trajectory
Θ_p = 50° ~ 70°
E_p = 20 ~ 160 MeV
Energy: NaI+Plastic (ESPRI)
Trajectory: Drift Chamber (ESPRI)

Target: Solid Hydrogen Target(SHT)
- Thickness: 2 mm
- Diameter : 30 mm

Cluster detection: Energy, Trajectory
Θ_c = 4° ~ 12°
E_c = 500 ~ 800 MeV
Energy: DSSD+CsI (Telescope)
Trajectory: DSSD (Telescope)

Residue detection: Energy, Trajectory
Energy(Brho): Drift Chamber (FDC0, FDC2)
ToF: Plastics (Hodoscope)
Trajectory: Drift Chamber (FDC0, FDC2)

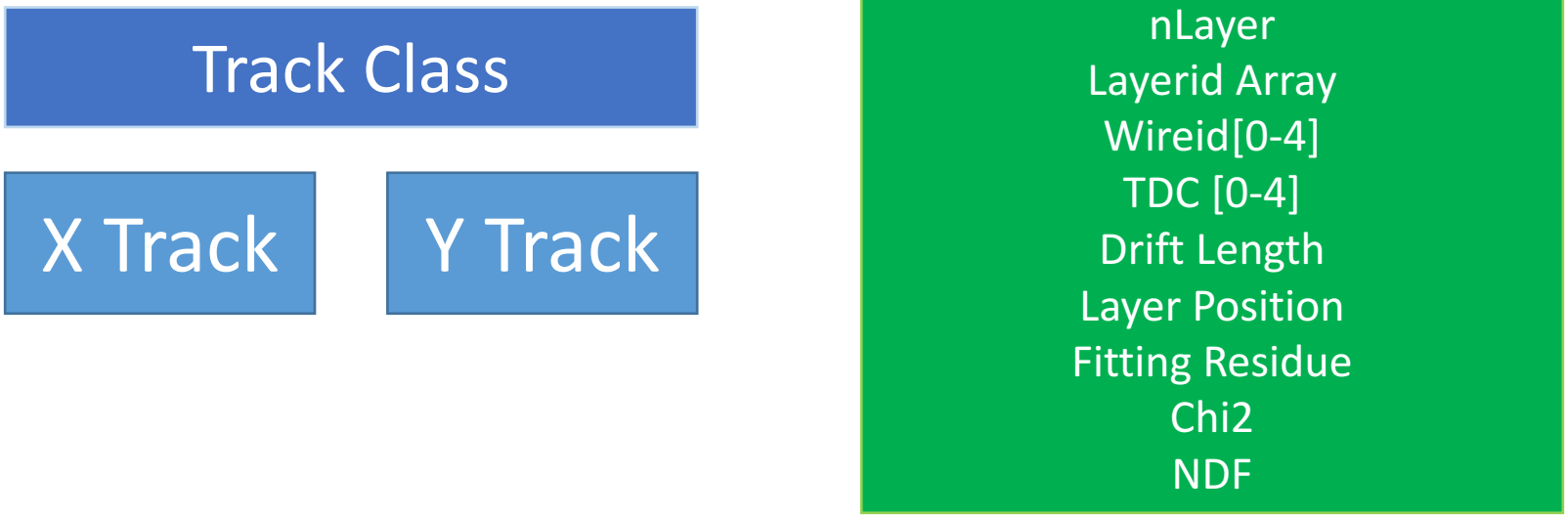
Neutron detection: Energy
Energy: Plastics (NEBULA)

Detector Level -- Drift Chamber

DC class

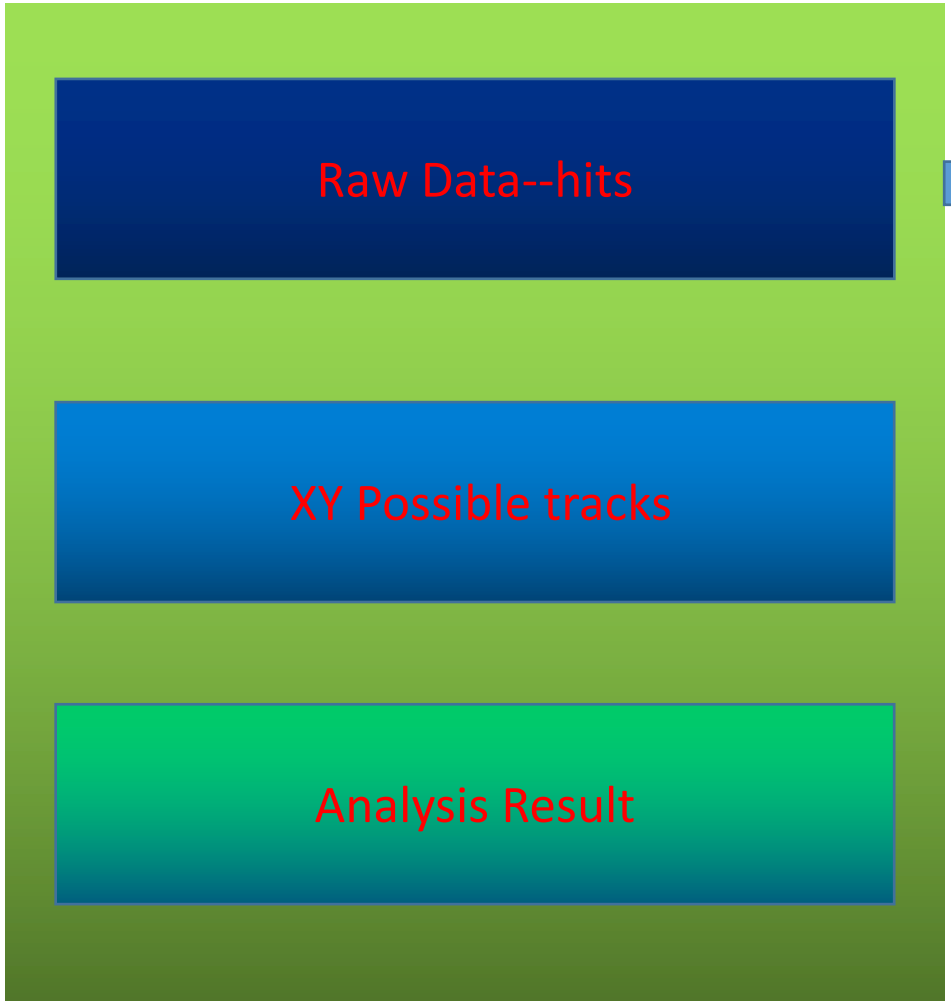
1. nhits : All hits of Whole DC(include all the layers)
2. layer_hits: each layer hit in order

Detector Level -- Drift Chamber



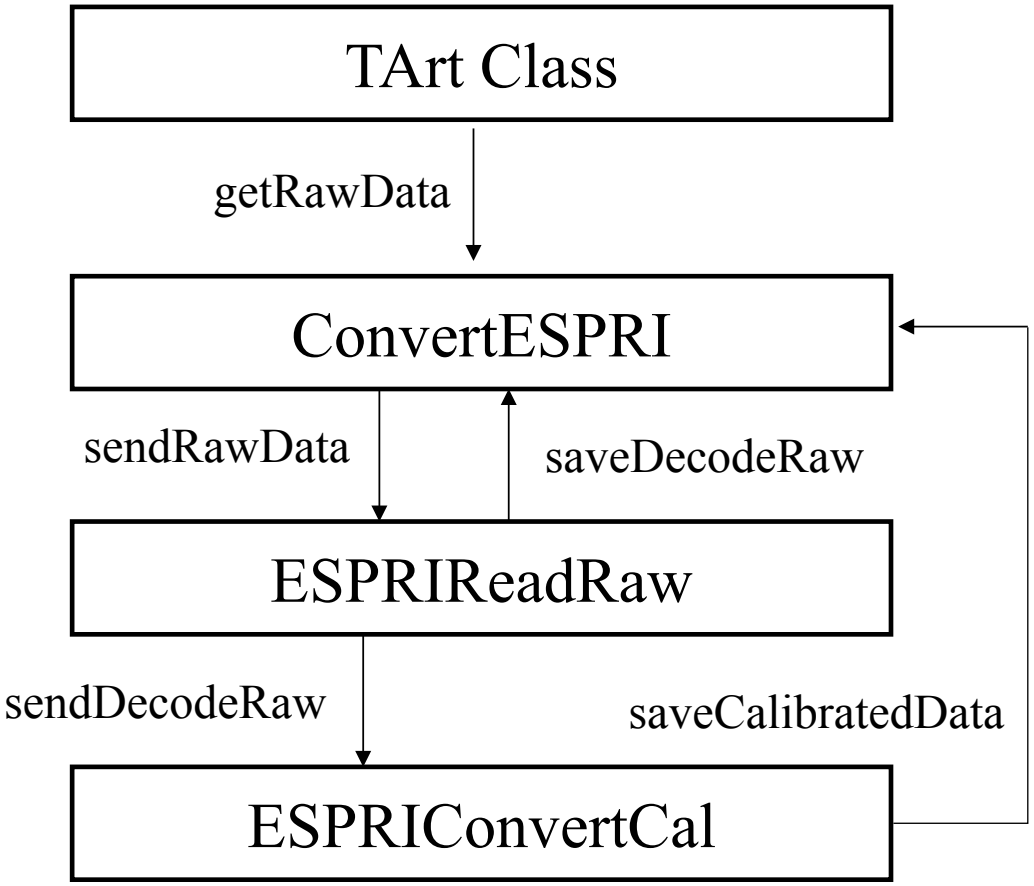
Detector Level – HODO Plastic Detector

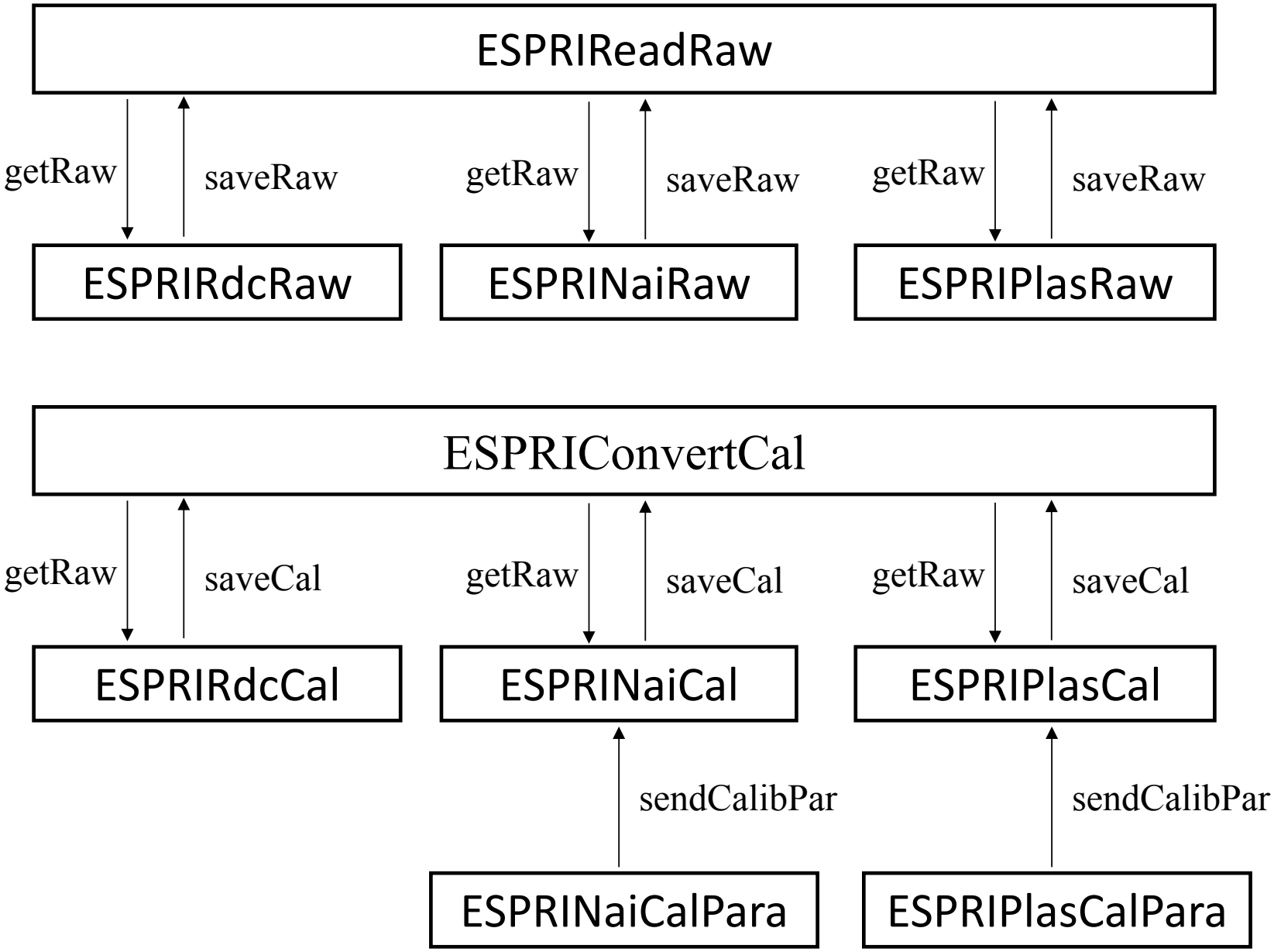
DC class



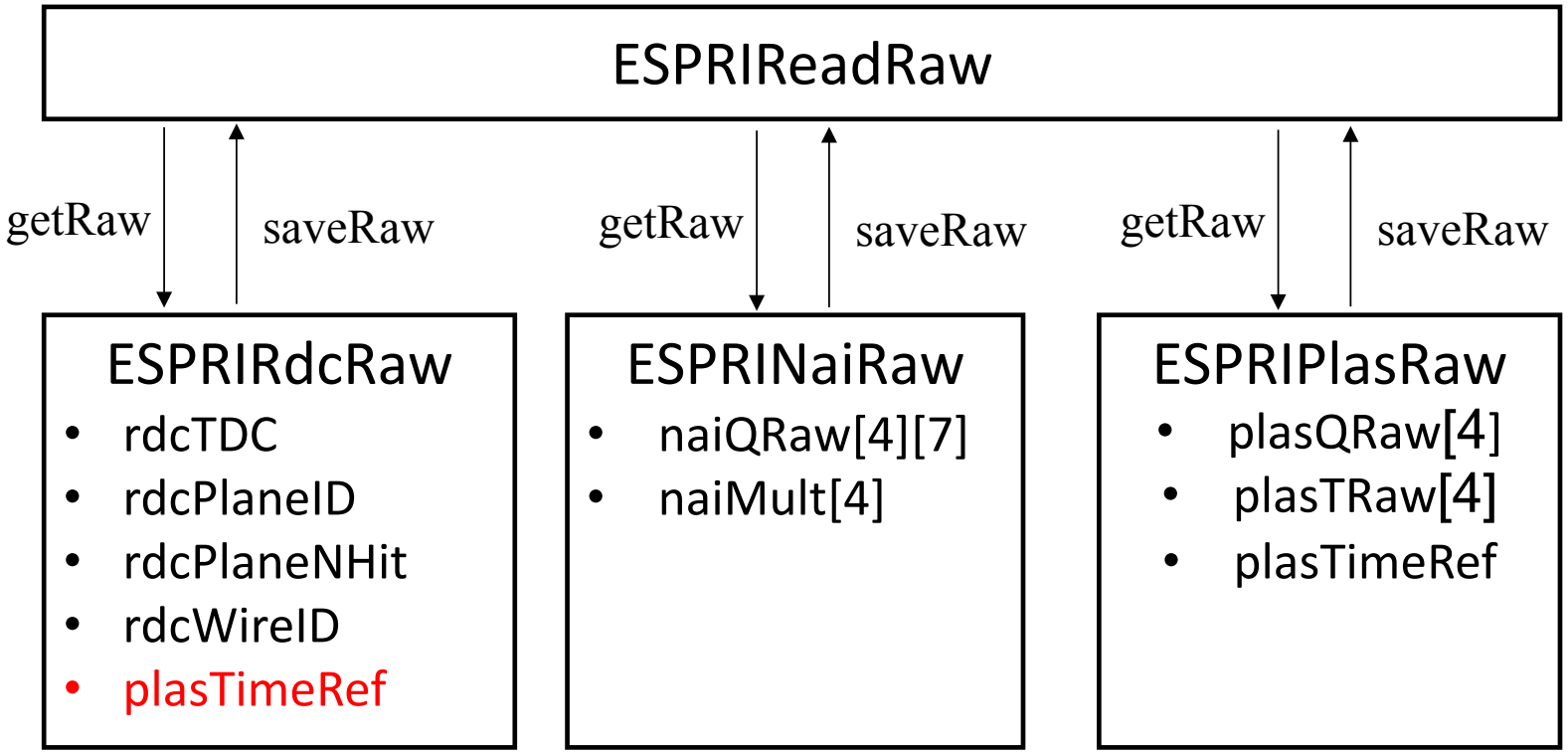
1. nhits : All hits of Whole DC(include all the layers)
2. layer_hits: each layer hit in order

ESPRI Converter Scheme




ESPRIReadRaw
getRaw
saveRaw
getRaw
saveRaw
getRaw
saveRaw
ESPRIRdcRaw
ESPRINaiRaw
ESPRIPlasRaw
ESPRIConvertCal
getRaw
saveCal
getRaw
saveCal
getRaw
saveCal
ESPRIRdcCal
ESPRINaiCal
ESPRIPlasCal
sendCalibPar
sendCalibPar
ESPRINaiCalPara
ESPRIPlasCalPara

ESPRI Converter Scheme



Nai and Plas config in Data Array

- 0:LL, 1:LR, 2:RL,3:RR
- 7 Bars on each side

ESPRI Converter Scheme