FCS PREShower, Software Tasks and Commissioning Plans

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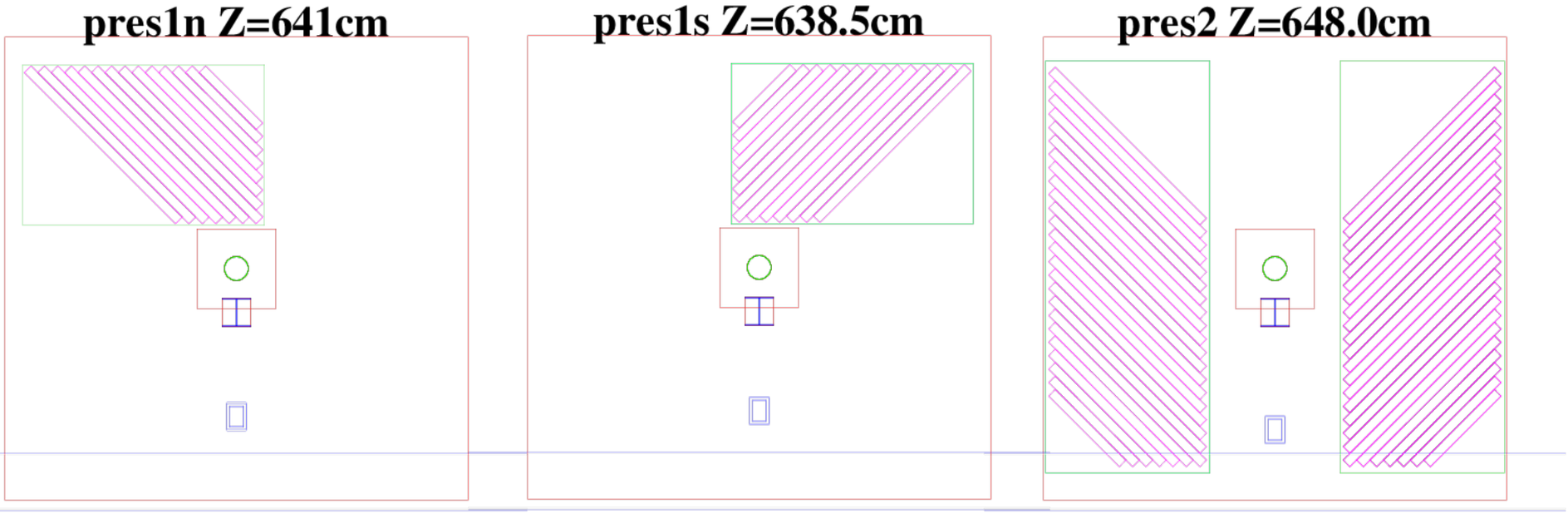
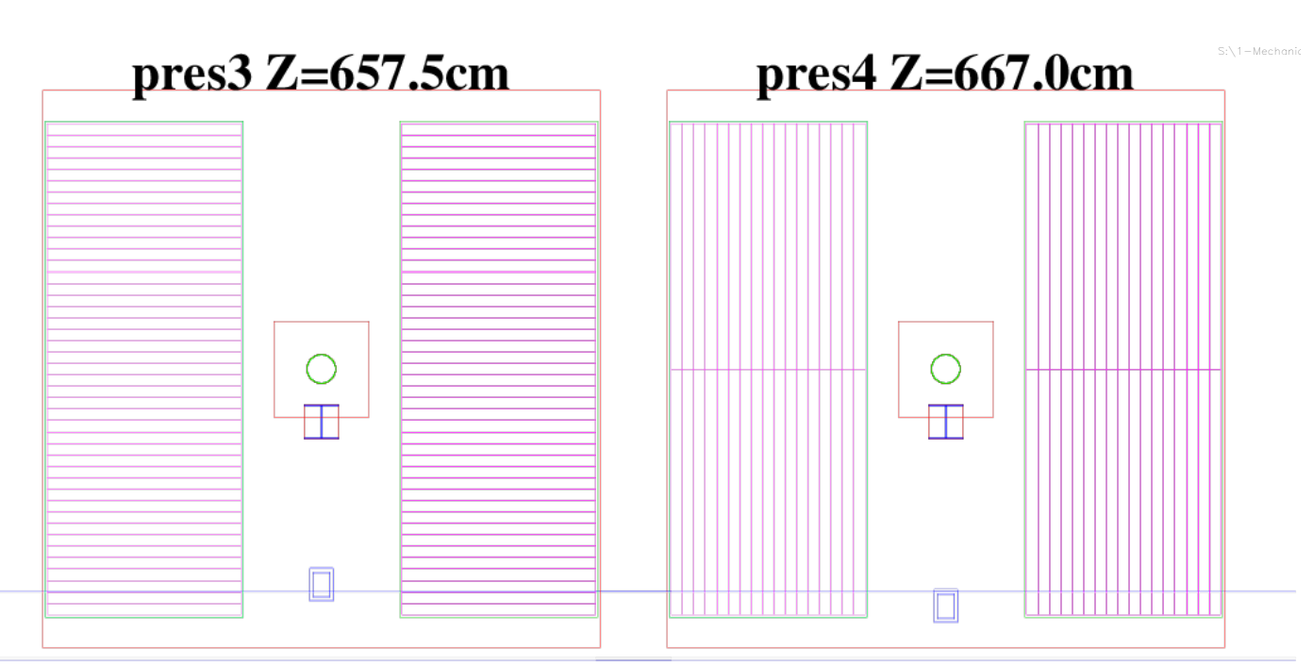
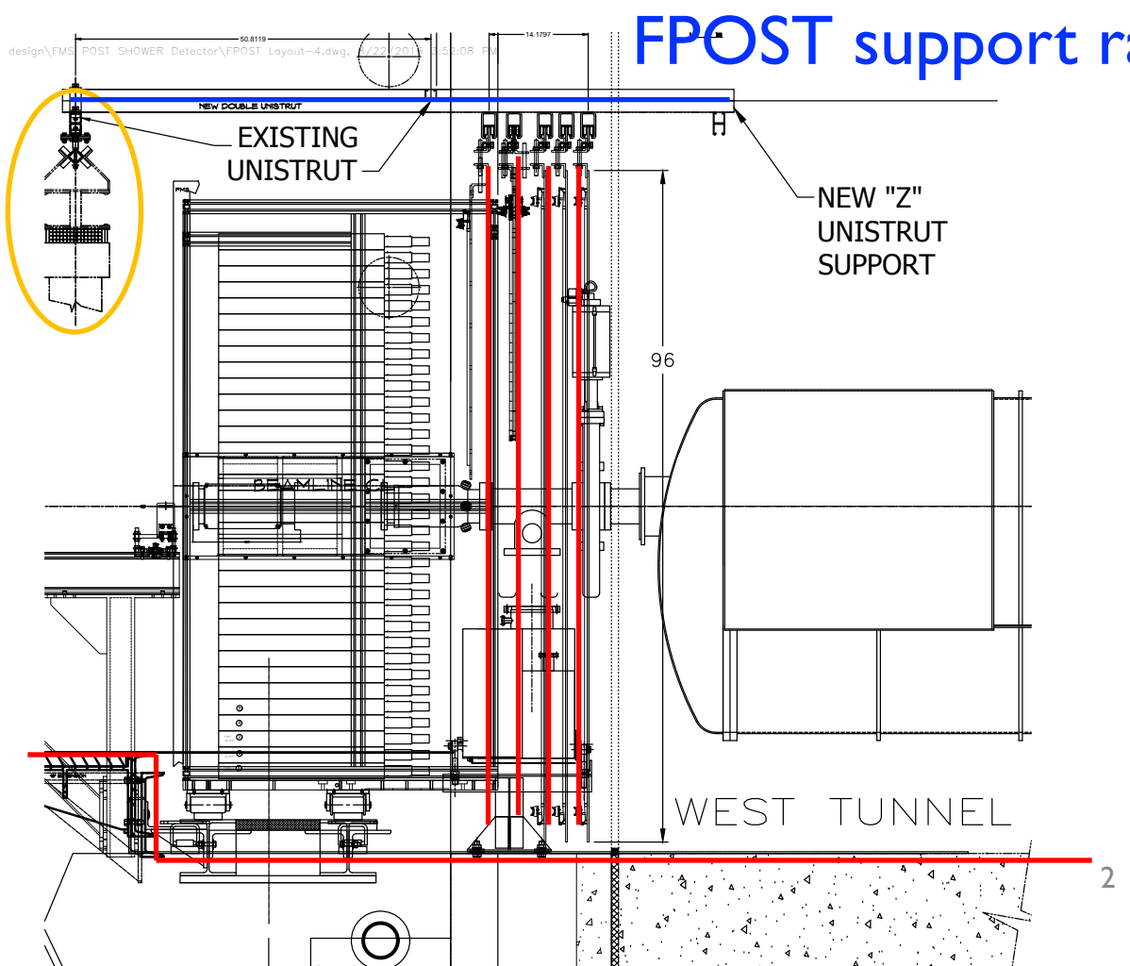
2020 Feb28

FMS Postshower

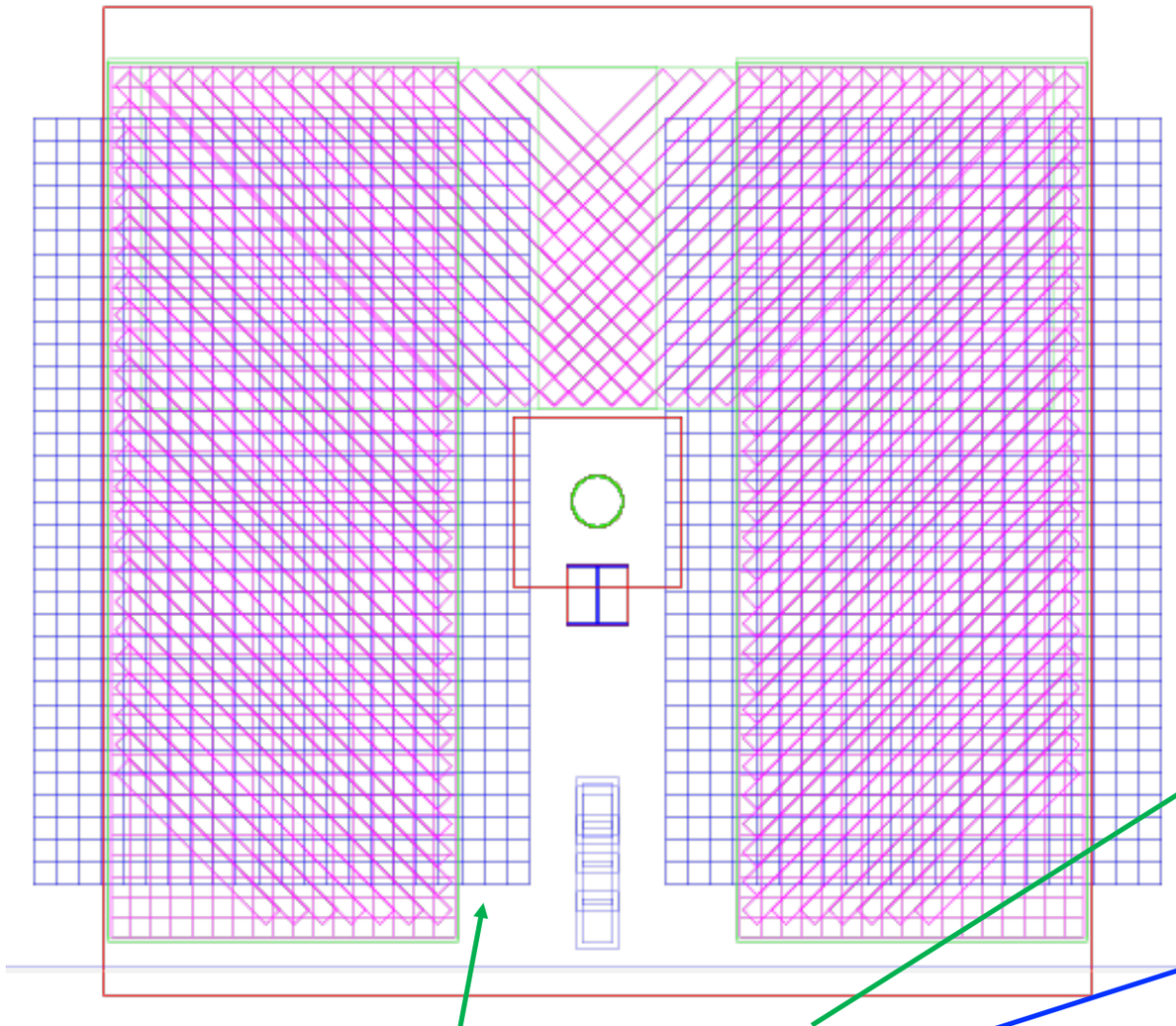


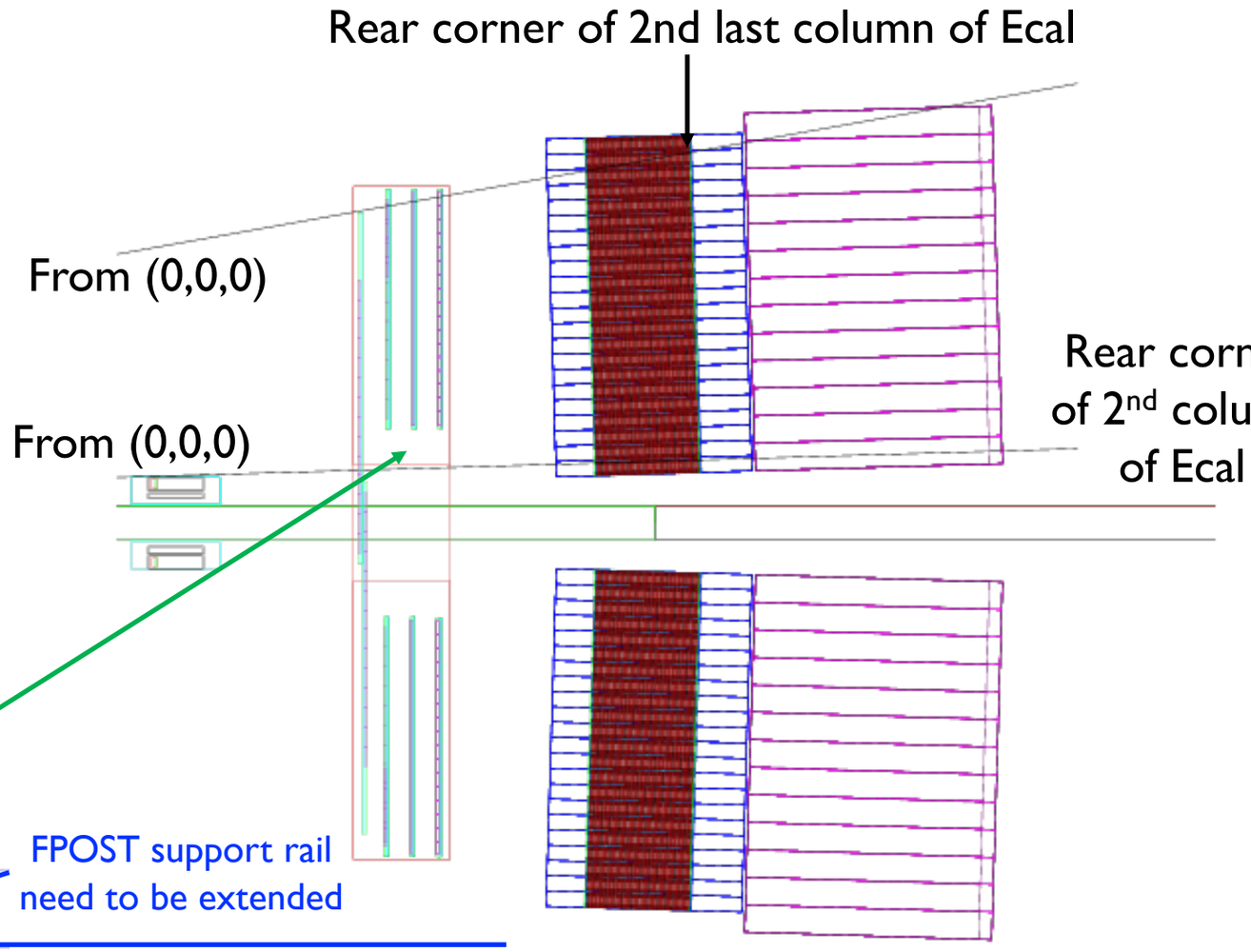


FPOST support rail



FMS Postshower as PRES is in STARSIM…But…





FPOST support rail need to be extended

Fiber bundles runs here

No coverage for 2~3.5 column of Ecal
Add shorter counters?

Interfere with pole-tip & carrier
No easy access to PRES FEEBds

Interfere with extended platform

262.130

CRANE COVERAGE

NEW DOUBLE UNISTRUT

9.724

4.791
[121.70]

.000
[0.00]

6.500
[165.10]

35.433
[900.00]

15.771
[400.58]

HCAL
90CM X 2M high

EMCAL

17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

78.740
[2000.00]

BEAMLINE CL

9.640

35.433
[900.00]

79.305
[2014.35]

FM PLATE 1.375 THK

10.455
[265.56]

11.510

16.965
[430.91]

18.468
[469.09]

13
[330.21]

28.035
[712.09]

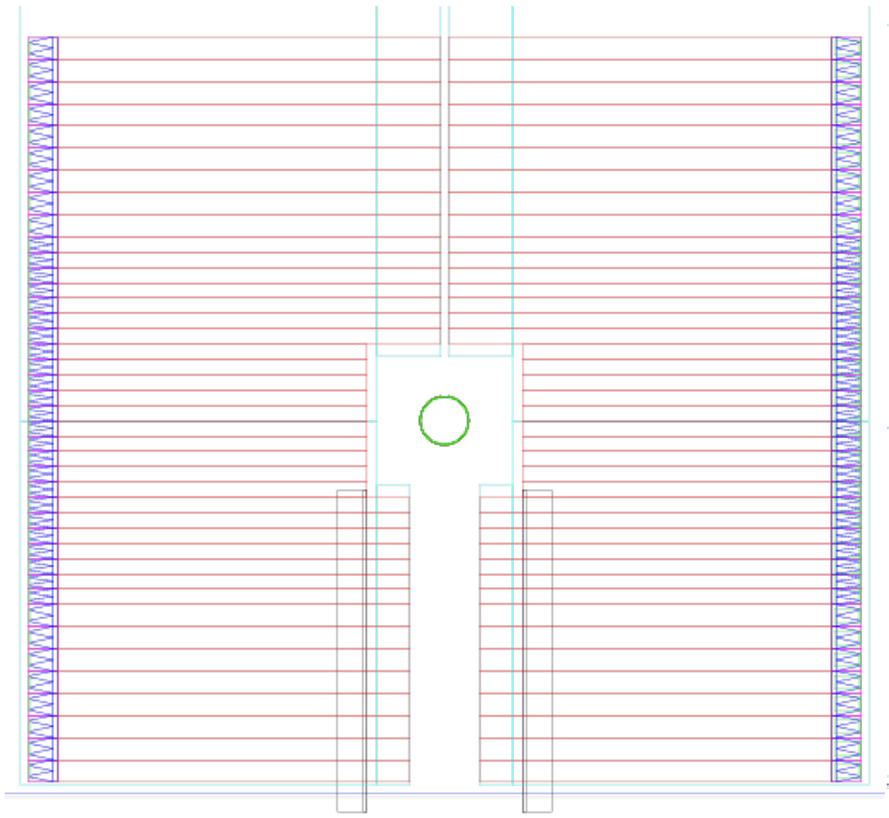
68.725
[1745.62]

45.000
[1143.00]

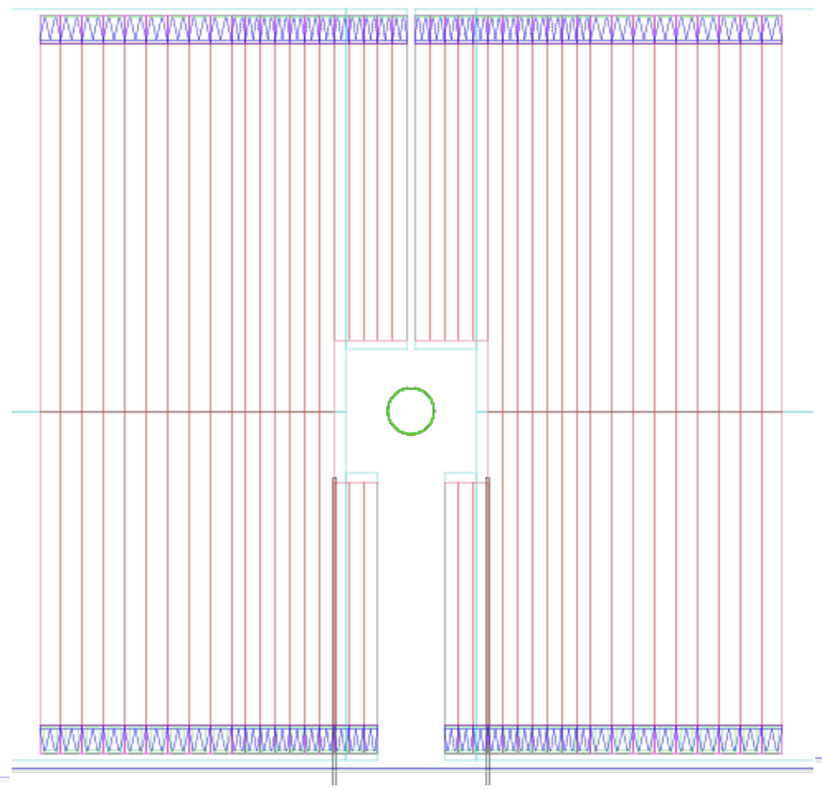
18

FMSPS for FCS PRES?

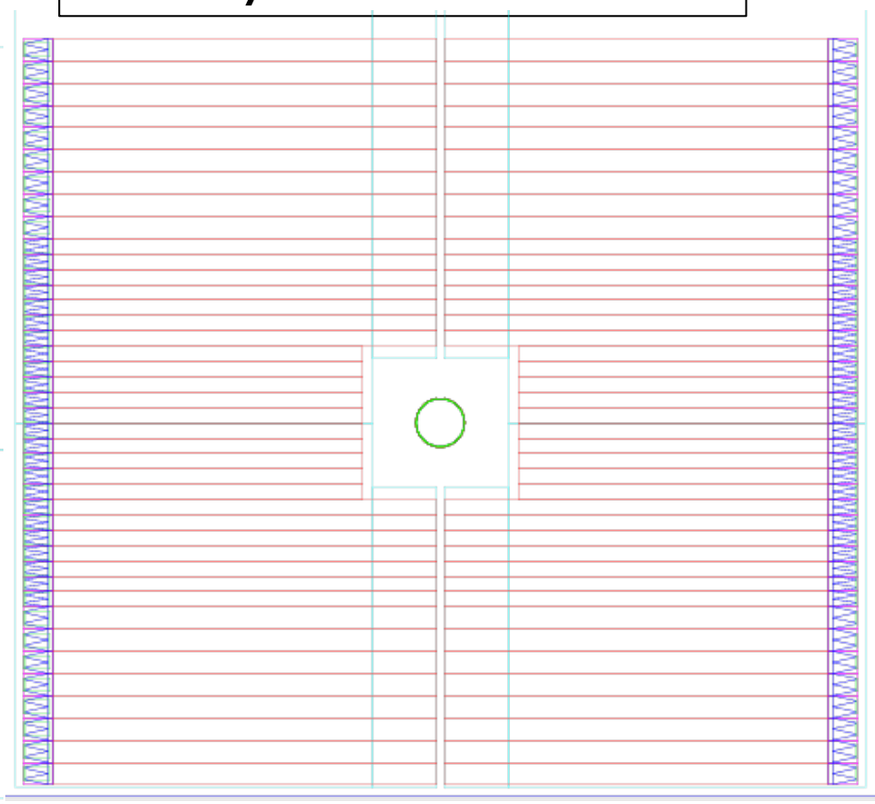
Layer1 – horizontal



Layer2– vertical



Layer3– horizntal



12 Narrow (4cm) slats + 9 wide (5.8cm) slats / quadrant / layer

Total 244 channels

Without Pb converter?

With FPOST FEEBds (should work?)

No 45degree plane – Layer1&2 only or add layer 3?

Even smaller than FPOST

G10 is thinner and floopier, so it has rigid (heavy) frame

Maps

https://www.star.bnl.gov/protected/spin/akio/fcs/index.html#Mapping

https://www.star.bnl.gov/protected/spin/akio/fcs/fcsMap2.pdf

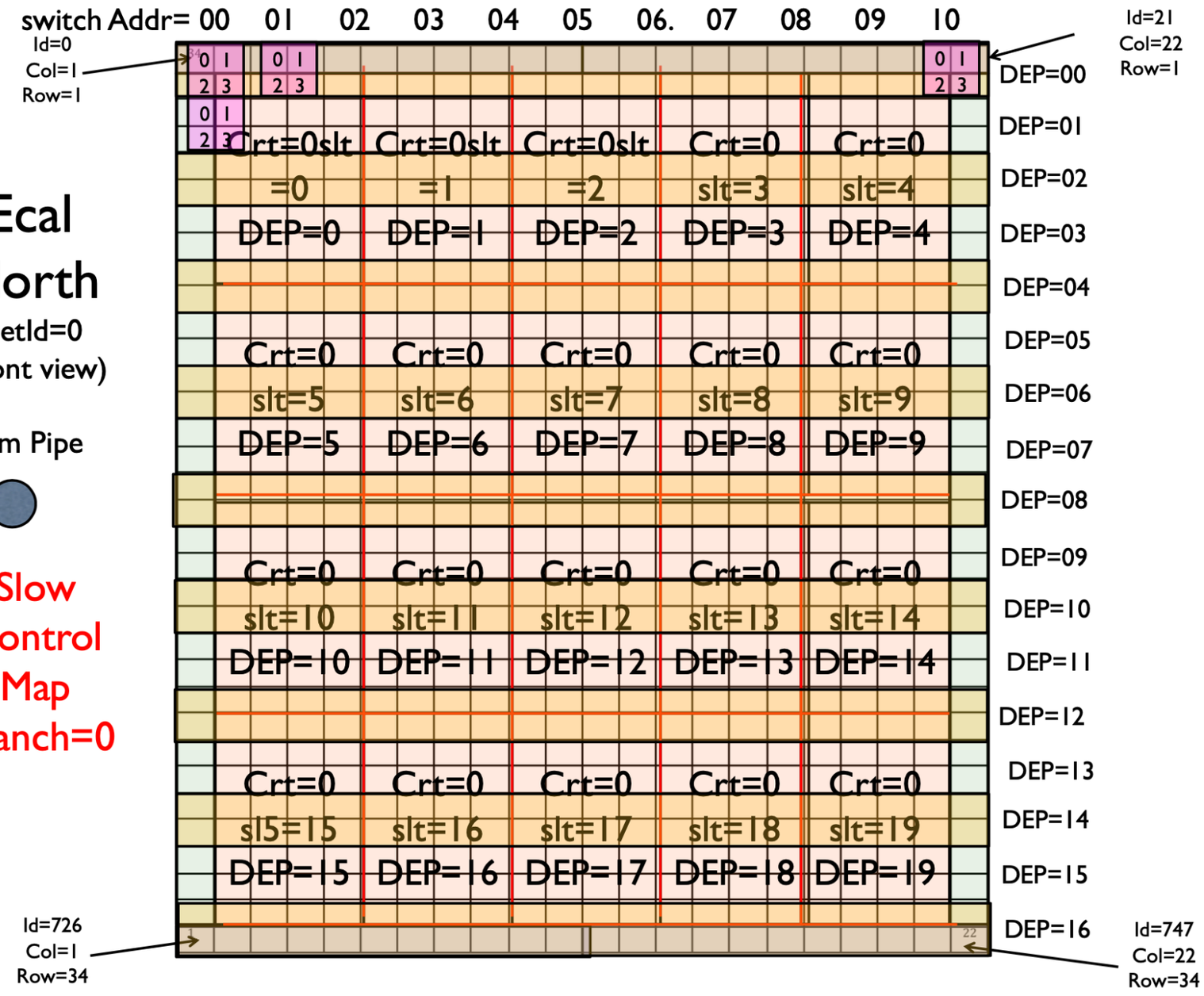
Readout Map was shown before

Slow Control Map added

A FEEBd will be connected to
up to 3 different DEP for signal
And yet another DEP for SC/LV

Text files for Readout & SC are on

daqman:/RTS/conf/fcs



FCS in STAR software

https://www.star.bnl.gov/protected/spin/akio/fcs/index.html

https://www.star.bnl.gov/cgi-bin/protected/cvsweb.cgi/offline/upgrades/akio/

- Geometry xml (WcalGeo0.g, HcalGeo0.g, PlatGeo0.g, PREShower
- G2t (PREShower)
- Fast Simulator (StFcsFastSimulatorMaker)
- StEvent (StFcsCollection, StFcsHit, StFcsCluster, StFcsPoint)
- Cluster Finder (StFcsClusterFinder)
- Photon fitting (StFcsPointMaker)
- (fake) DB for constants/calibration/utilities (StFcsDbMaker)
- 2D Event Display (StFcsEventDisplay)
- 3D Event Display with FTS hits and tracks (fcs_trk_ed.C)
- Pythia Filter for DY & Jet (FcsDYFilter & FcsJetFilter)
- Pythia Filter for DY Back Grounds
- After GEANT (and possibly middle of GEANT) filter for DY Back Grounds
- Trigger Simulator (StFcsTriggerSimMaker)
- Online Raw data reader (StFcsRawDaqReader)
- Offline Raw data reader (StFcsRawHitMaker)
  - Including trigger algorithm result (ch32)
- MuDst & PicoDst

In CVS
Done
Not Yet

Software tasks

- Finalize Run19 200GeV AuAu analysis
  - MIP calibration applied to pi0 analysis
  - Making MIP (Hanna) & pi0 (Xilin) maker as official part of CVS/QA
- Reliable & fast signal fit vs time-bin & signal simulator with pile-ups
- Hcal z-dependent light collection efficiency MC
  - Code is ready https://www.star.bnl.gov/protected/spin/akio/fcs/lcz/index.html. Any taker?
- Hcal hadronic response characterization (& Hcal cluster finder?)
- Ecal shower shape between data vs STARSIM inconsistent?
- MC for Hcal MIP (charged hadron which did not make shower) calibration
- Finalize PRES design and geometry
  - DY MC to evaluate importance of coverage around beam pipe & PRES size
  - Pres - Ecal 4x4 trigger mapping
- Matching FCS with Tracks
- Signal (J/psi, DY, etc) and QCD background MC
  - JPSI/DY reconstruction code
- jEVP
- Online monitoring

Testing & Commissioning discussion

- **Cosmic test @ 510 Lab**
  - Pres : Done with12572-050 (used for FPS/FPOST, no longer available)
  - 14160-3050 (too high gain, long tail)
  - 14160-3015 (too low gain, not available)
  - Evaluate13360-3050 (ordered 10)
  - Ecal : Done with 12572-015 (Run19)
  - 14160-3015 (not available due to QA issue)
  - Evaluate12572-015 with final FEEBd?
    - 0.0009GeV/ch with full TB sum & 1db
    - 0.0053GeV/ch wasoriginal design (32kch @ 180GeV) with ???db
- **Run20**
  - Still need a safety review
  - Done: FPOST FEEBd control by DEP by Tonko
  - Installing PRES & STGC
  - Goal?
- **2020 Sep ~ 2020 Dec**
  - Goal?
  - Software needs?
  - Manpower?
  - Can we trigger & see cosmic muon from sky?
- **Run21**
  - ???