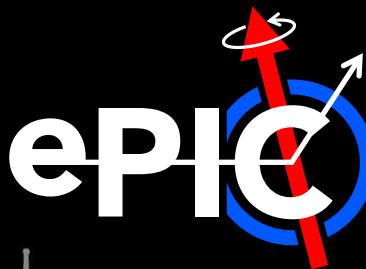




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# ePIC SVT Grounding Scheme

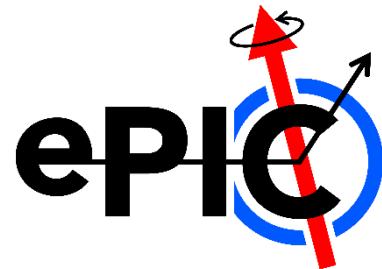
James Glover, Georg Viehhauser

SVT Working Meeting  
University of Oxford

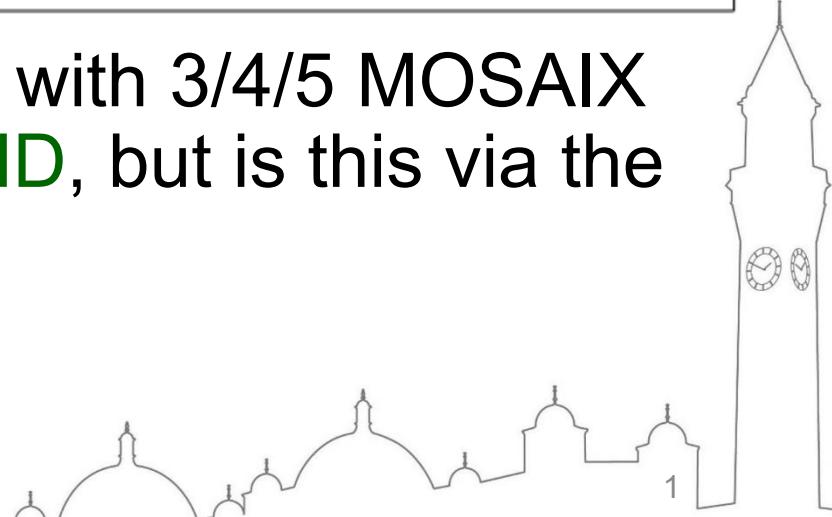
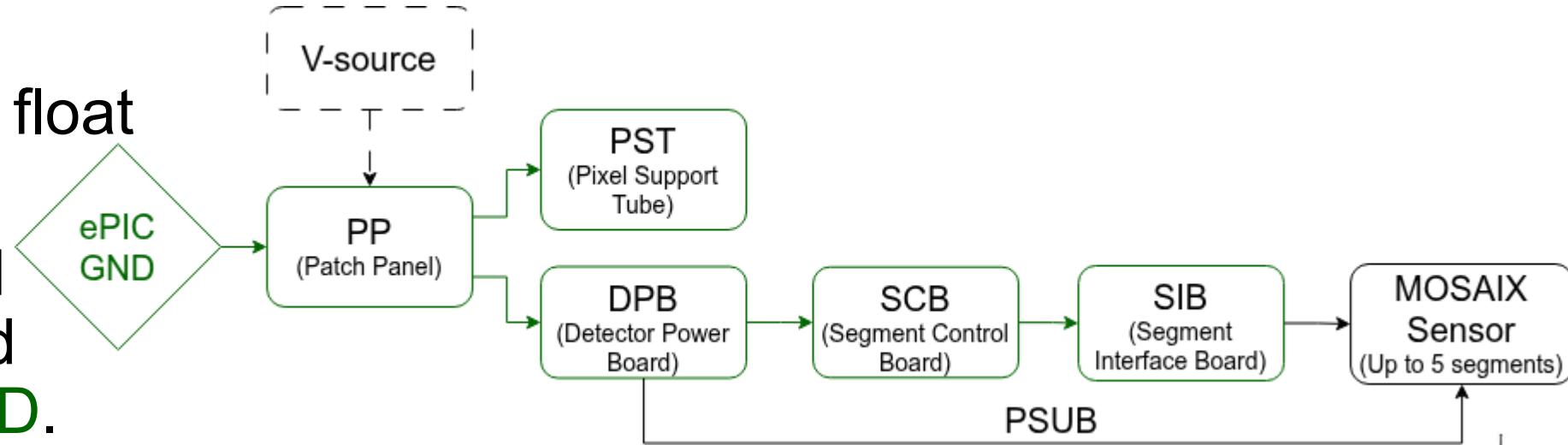
17<sup>th</sup> December 2025



# Simple IB



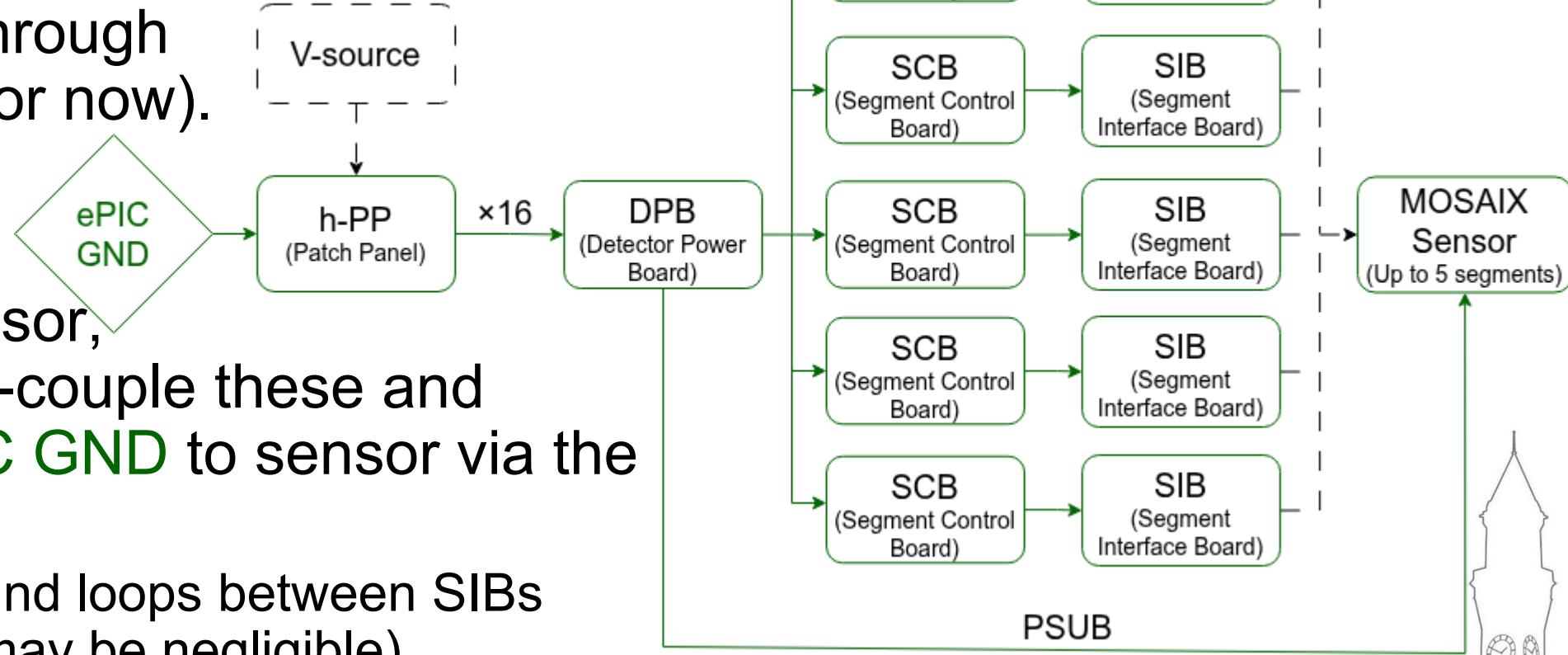
- “ePIC GND” is the detector ground, based on the existing STAR infrastructure.
- Power supplies float at the rack end.
- All boards need to be connected to the **ePIC GND**.
- Each MOASIX sensor (diced piece of silicon, with 3/4/5 MOSAIX segments) also needs to connect to **ePIC GND**, but is this via the SIB or the DPB?
  - Not both, avoid ground loop.



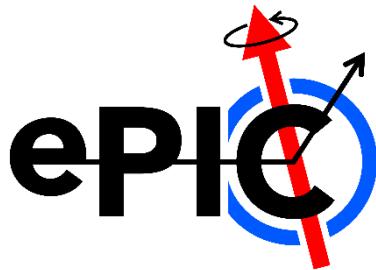
# IB proposal



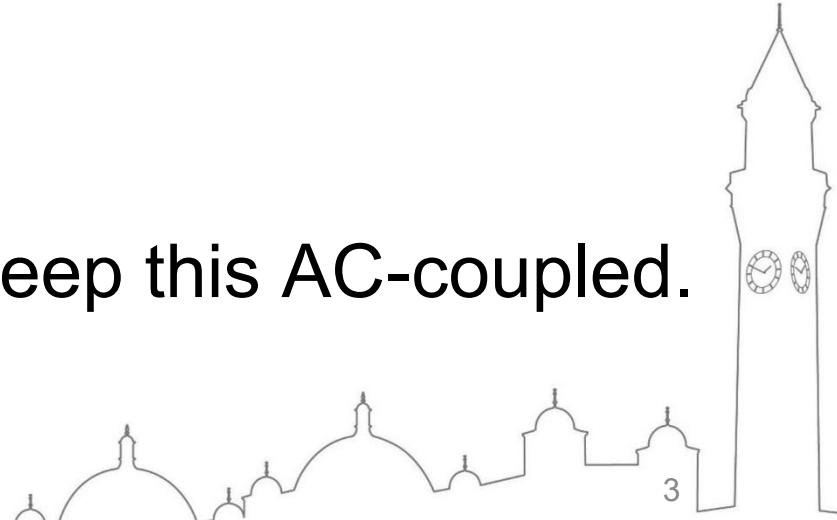
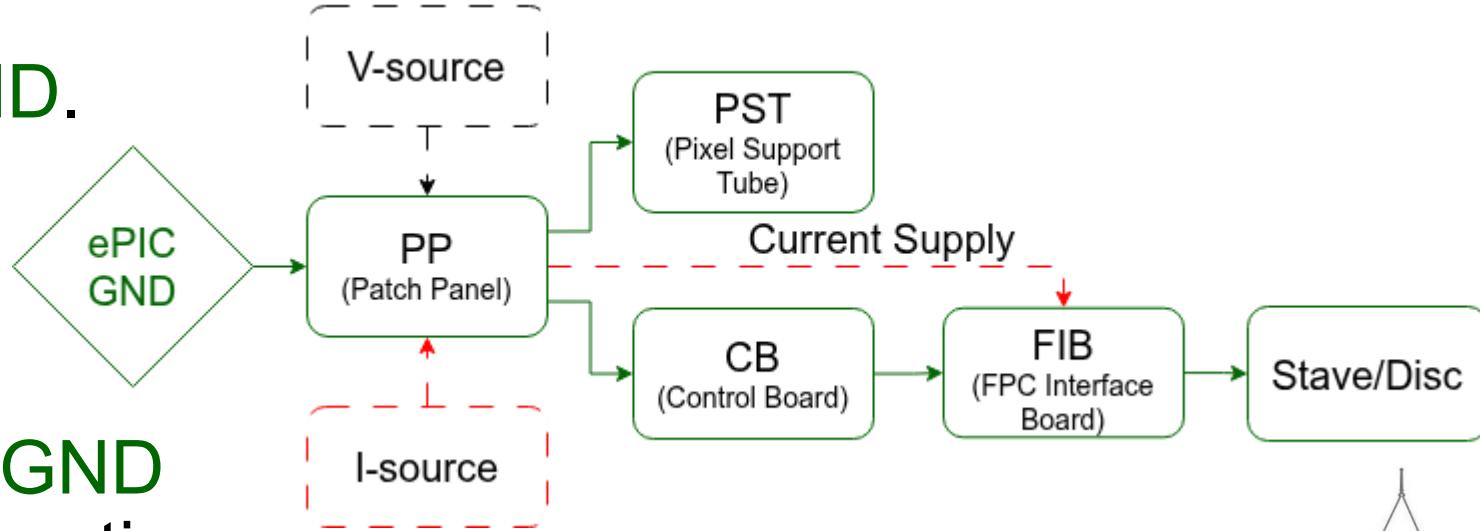
- Assume PST has direct **ePIC GND** connection through PP so skip (for now).
- Many SIBs needed per MOSAIX sensor, therefore AC-couple these and connect **ePIC GND** to sensor via the DPB.
  - Avoids ground loops between SIBs (although, may be negligible).



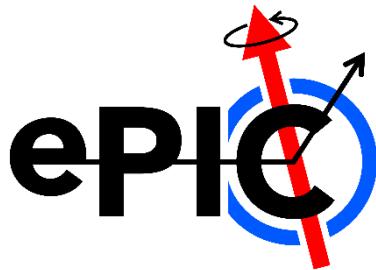
# Simple OB+Discs



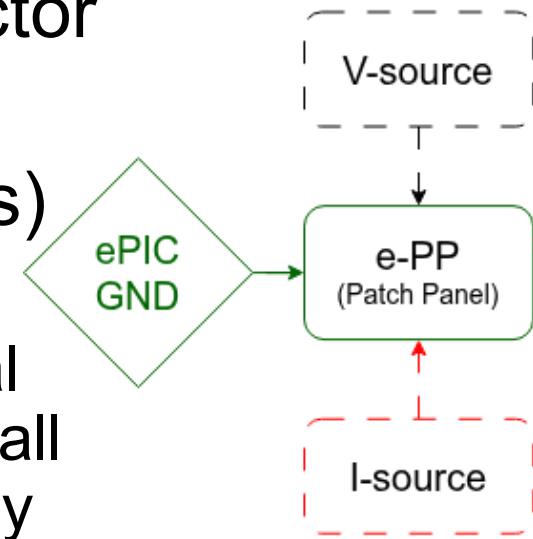
- Power supplies float at the rack end.
- All boards need to be connected to the **ePIC GND**.
- Each FIB supplies **ePIC GND** to an FPC/SP chain.
- Does the Stave/Disc structure connect to **ePIC GND** via the FPC, or direct connection to the FIB?
- Current supply connects directly to the FIB, keep this AC-coupled.



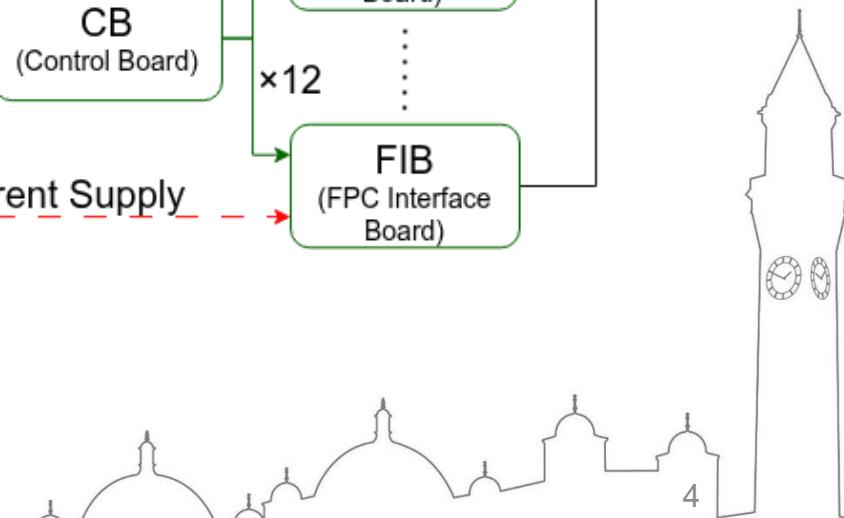
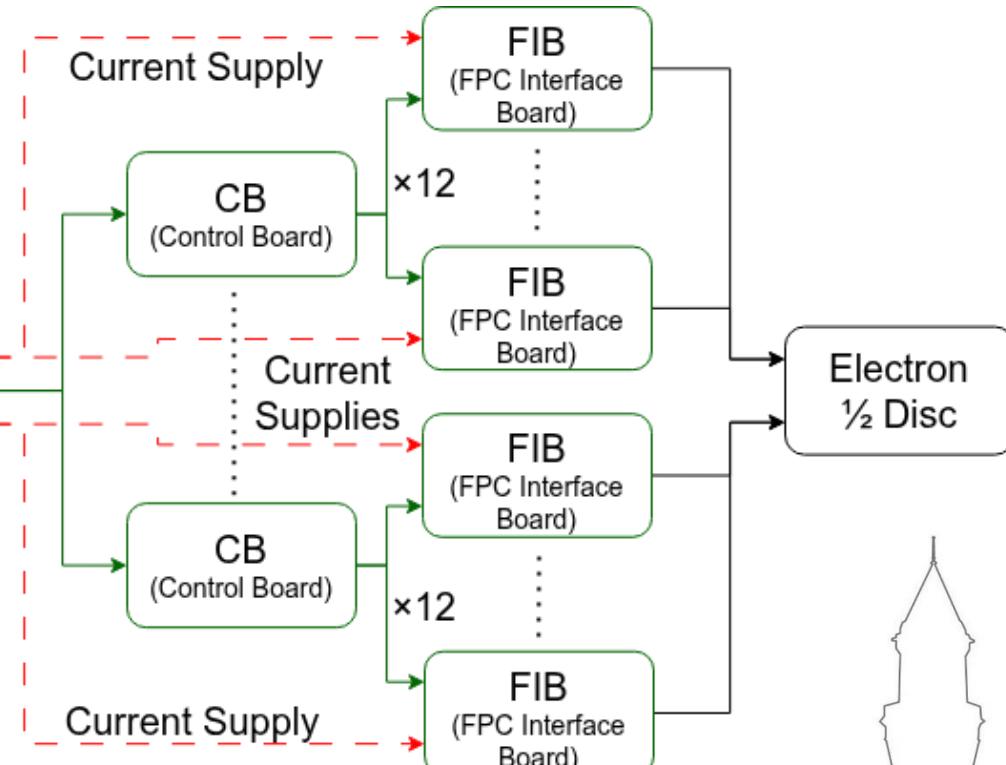
# Discs (electron-side)



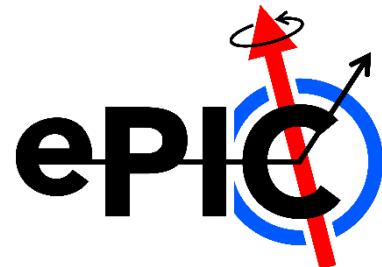
- All FIBs on the same  $\frac{1}{2}$  Disc connect to **ePIC GND** via CBs and a PP on the same side of the detector (all electron-side).



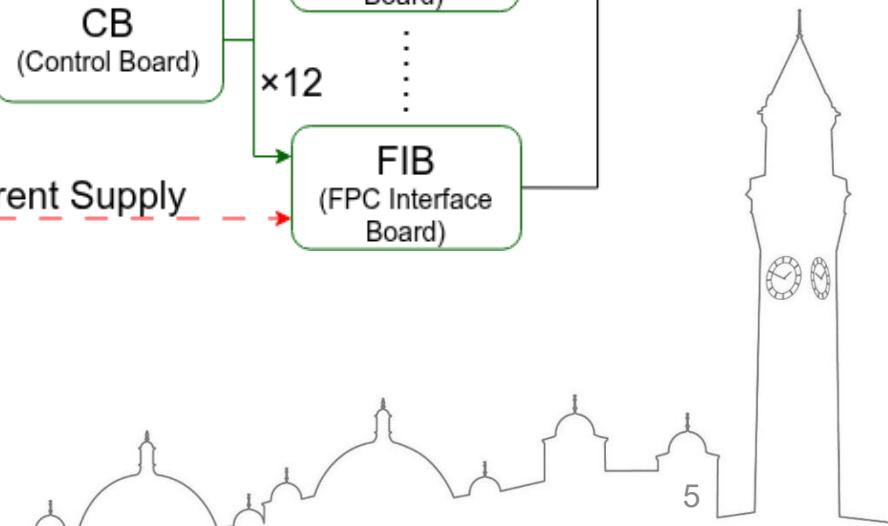
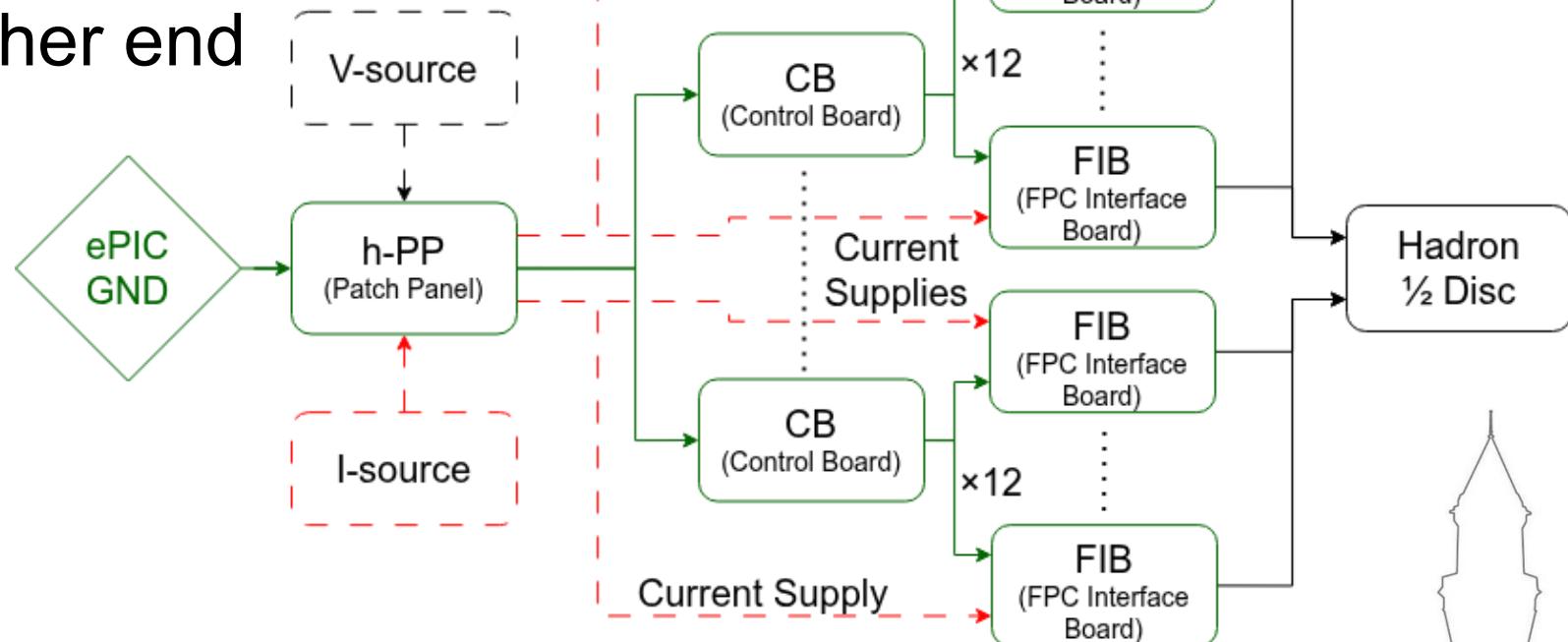
- Multiple CBs (and FIBs) need per  $\frac{1}{2}$  Disc.
  - Distances and potential differences may be small enough for all to directly connect to the  $\frac{1}{2}$  Disc.
- Master CB/FIB and AC-couple the rest?



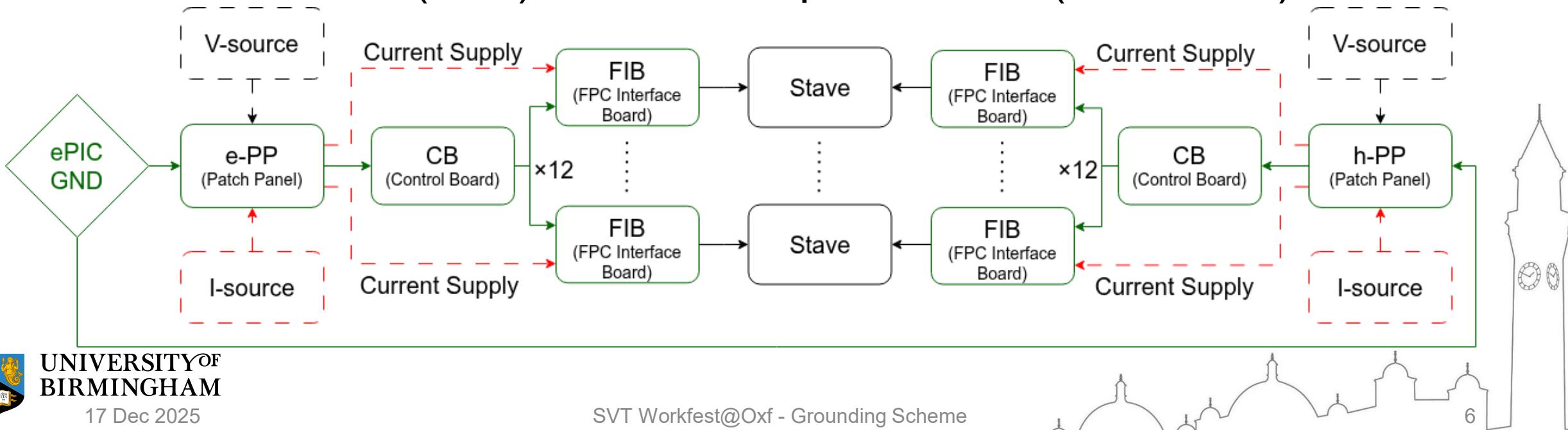
# Discs (hadron-side)



- Schematically identical to the electron-side.
- Just uses PP on the other end of the detector.



- Path for ePIC GND to the FIBs is same as with Discs.
- Every stave will have FIBs supplied from both the e & h-sides.
  - These have very different paths and are likely to be a non-negligible ground loop.
- Master CB/FIB (side) and AC-couple the rest (other side)?

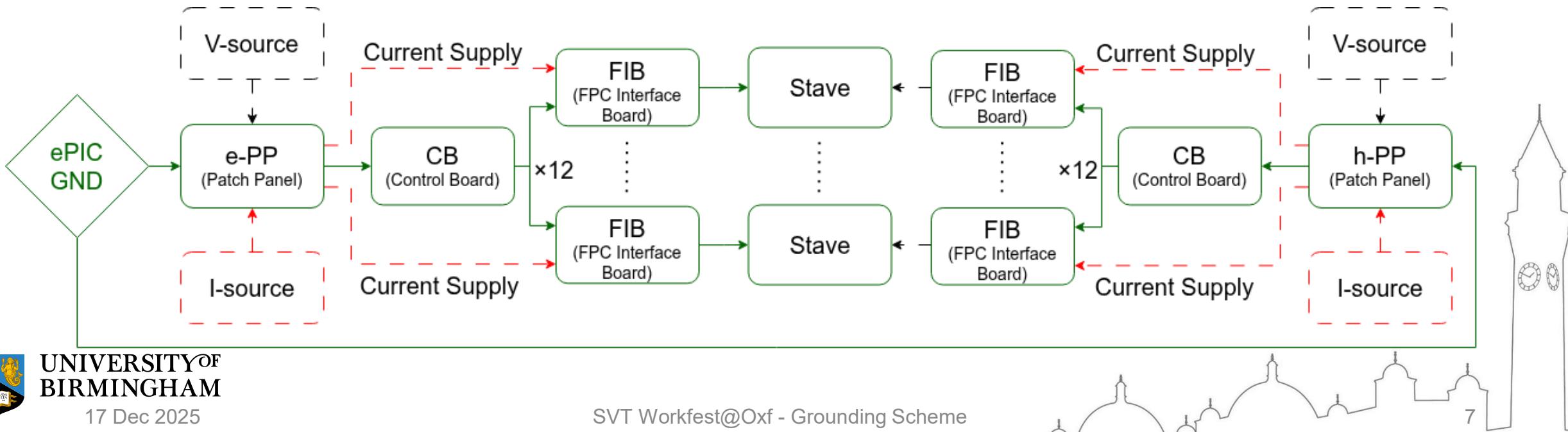


# OB proposal



ePIC

- This could look something like the following.
  - Could equally see ePIC GND fed from the h-side.
  - Could we have multiple orientations (e-side vs h-side) on same support structure?



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17 Dec 2025

SVT Workfest@Oxf - Grounding Scheme



# Thank you very much!

Any questions?





# Additional (support) slides

