Thoughts about disk construction

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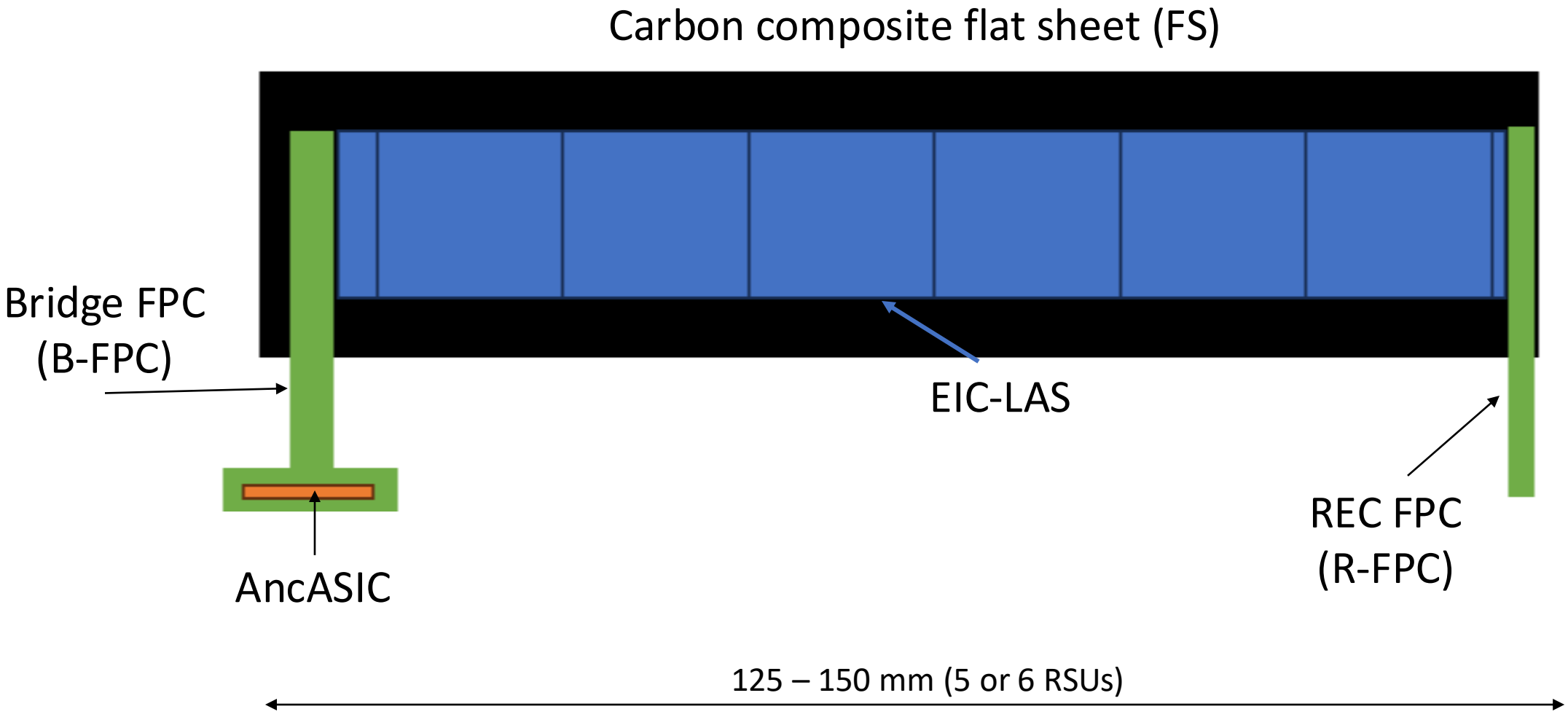
LBL EIC Meeting

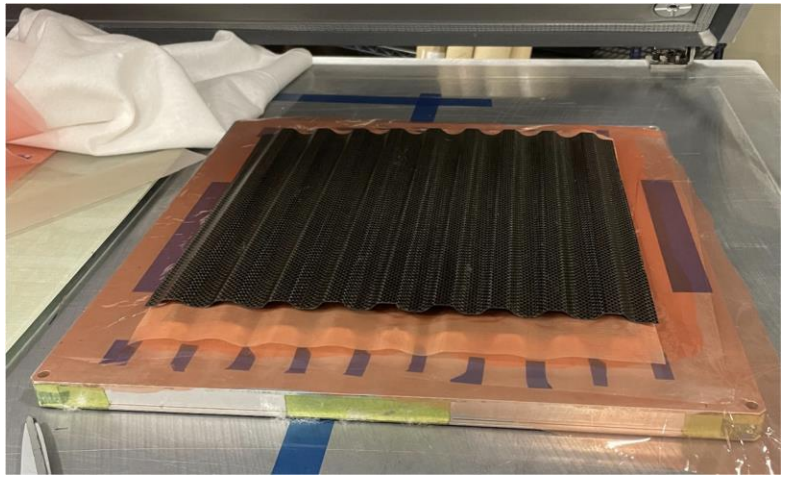
Intro & caveats

- This is a high-level, first look at steps for disk construction
- Based on current knowledge of EIC-LAS, AncASIC, FPC, corrugation, etc.
- Sizes, positions, exact dimensions can/will change

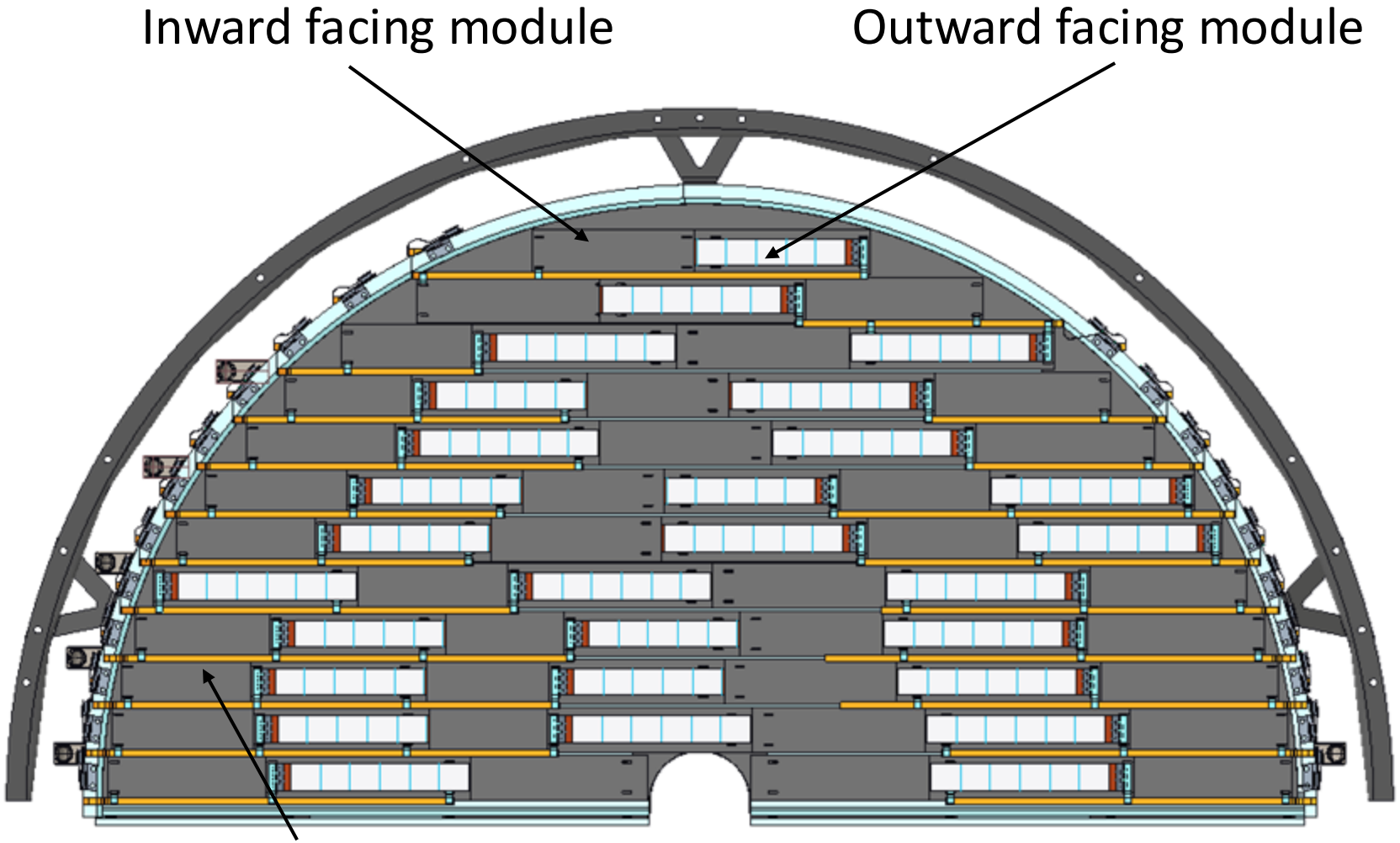
Module components



Disk components



Corrugated core



Reception of pieces

- EIC-LAS & AncASIC reception
  - Visual inspection
  - TBD: Electrical checks (unlikely, but should be verified)
  - Storage (dry chamber?)
- Bridge, REC, & Main FPC reception
  - Visual inspection
  - Electrical checks
  - Storage
- Carbon composite flat sheet & corrugated core
  - Visual inspection
  - Flatness measurement

Visual inspection → using microscope

FPC electrical checks with PCB & programmable multiplexer

Module construction

- Preparation of FS
- Gluing of EIC-LAS sensor to FS
  - Alignment & placement
  - Metrology (flatness & residuals)
- Gluing of B-FPC & R-FPC to FS
  - Verification of type (as necessary)
  - Alignment & placement
    - Inward facing module must have FPCs through slot
  - Metrology (flatness & residuals)
- Gluing of AncASIC
  - Alignment & placement
  - Metrology (flatness & residuals)

TBD:

- Electrical checks before wire bonding (unlikely)
- Alignment, placement, & gluing of all components in one step. Then metrology once afterwards
- Wire/tab bonding AncASIC to B-FPC before gluing

Module construction cont.

- Wire/tab bonding of B-FPC/R-FPC/AncASIC/EIC-LAS (order TBD)
  - Wire/tab bond EIC-LAS to B-FPC & R-FPC
  - Wire/tab bond AncASIC to B-FPC
  - Visual inspection
- Module testing
  - Electrical checks
  - Readout tests
  - Storage (dry chamber?)

Half-Disk Construction

- Preparation of corrugated core
- Gluing of edge pieces in corrugated channel
- Gluing of modules to corrugated panel (front face)
  - TBD: One row at a time or sets of inward and outward facing
  - Alignment & placement of inward modules
  - Alignment & placement of outward modules
- Module testing
  - TBD: Electrical checks
  - Metrology (flatness & residuals)
- Test with air flow for leaks
- Gluing of M-FPC
  - Verification of type
  - Alignment & placement
- Connection of B/R-FPCs to M-FPC (soldering? Wire/tab bonding?)
  - Visual inspection
  - Electrical checks
- Disk row testing
  - TBD: Full or partial set of module tests
- Metrology of front disk face

Repeat for back face

Misc.

- Not included in this outline
  - Disk rim attachment
  - Connection to FIBs
  - Automation? CMM? Disk alignment with tooling rather than camera?
- >2300 modules needed for assembly
  - Assuming 90% yield and 20% spares → ~3200 modules to be produced
- Expect module assembly to be the bottleneck
  - Wire/tab bonding & then testing