

Discussion questions

EPIX/FPIX

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- Centralized CAD verification ?
- 1x1 modules ?
- Granularity of High voltage in phi and r
- Serial powering module chains considered in terms of tracking coverage loss if failure
- HDI design choices : ie, copper vs. aluminum
- Can we avoid DC/DC converters for IpGBT ?
- Is Pixel size optimized properly for division of charge within cluster ?
- Module assembly : gantry vs. jig – investment in personpower vs. reduction of human error, standardization
- Number of flavors of modules vs. simplification of system

General

- Centralization of CAD diagrams
 - With many components from many institutions, do we need an engineer Guru for maintaining mechanical designs to avoid collisions when the system is assembled ?
 - E.g., DC/DC grounding connection colliding with cooling pipes and causing short
 - Introduces additional time overhead
 - But may prevent serious problems that happen when there is little time left to react
 - To work, any component that is changed must be updated in the system and verified
- How to verify parts that are separately verified work as a system
 - E.g. timing of connected components

1x1 modules

- EPIX group is studying 1x1 modules for inner ring to reduce dangerous overlap
 - May also improve other aspects
 - Reduce number of chips, links, power
 - Useful also for FPIX ?

Modules

- Configurable double column amplifier voltages
 - Radiation damage varies strongly wrt radius
 - Modules allow configurable voltages in one direction.
 - Is this optimal for both barrel and disks ?

Serial powering

- We should think about what tracking coverage is lost if we have a failure of a serial powering chain
 - Avoid cases where a block of Eta/Phi is worsened

HDIs

- Copper vs. Aluminum conducting planes
 - Aluminum saves in radiation lengths overall
 - But needs to be evaluated further

DC/DC converters for IpGBT

- Bad taste in our mouths from DC/DC converters
- Can we avoid this with dedicated lines ?
 - Comparison of services required, power loss, etc.

Pixel cluster size

- Rate estimates may indicate pixel clusters are large in some parts of system
 - Could be problem since cluster charge divided up among many pixels
 - Cause cluster splitting
 - Difficulty in seeing signal charge above noise threshold
 - Higher pixel hit rates

Module assembly

- Gantry vs. Jig ?
 - As in Rachel's talk
 - Can procedures be standardized ?

How many flavors of modules should there be ?

- Simplest case :
 - 2 types : 1x2 and 2x2
- Further :
 - 4 types: 1x2, 2x2 for EPIX/FPIX and BPIX
 - Require different HDI
 - 5 types: 1x1, 1x2, 2x2 for EPIX/FPIX and BPIX
 - EPIX considering 1x1, but perhaps also useful for FPIX (? - previous discussion)
- Maximal variation :
 - 8 types : BPIX (1x2, 2x2), FPIX (1x1, 1x2, 2x2), EPIX (1x1, 1x2, 2x2)
- Means 8 flavors of production centers ?

Other :

- Updating FPIX disk radius to higher radius avoids high radiation
 - EPIX radius still optimal
 - Data rates updated