Update on disks

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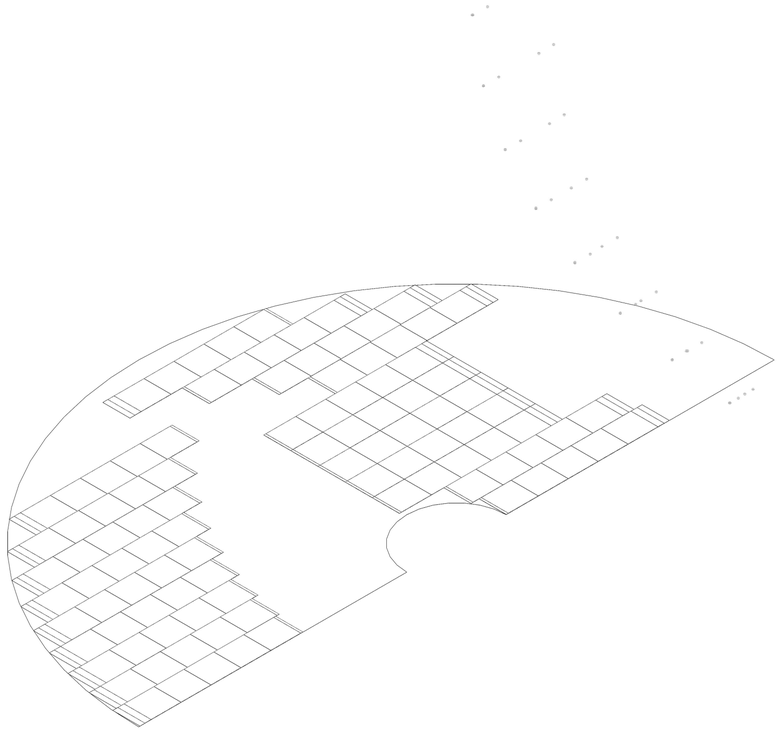
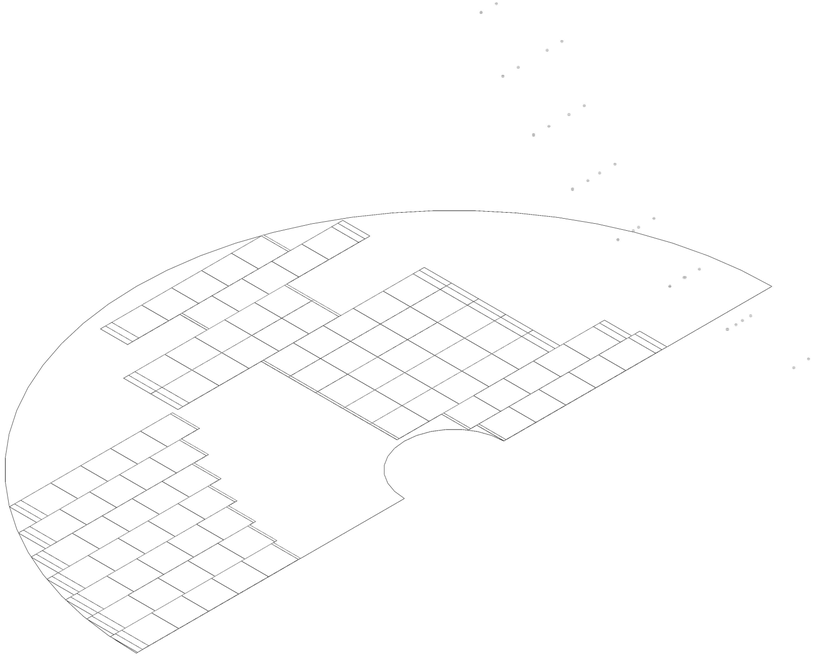
With inputs from Nicole Apadula, Eric Anderssen, Joe Silber,

Errors, misconceptions, and other are of course my own.

ePIC SVT DSC meeting
August 22, 2023

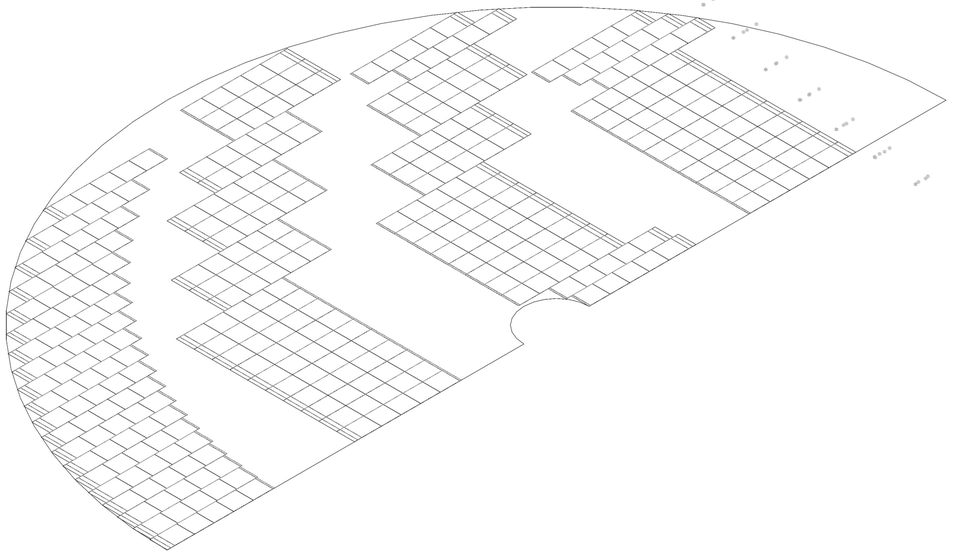
Disk concept — Tiling

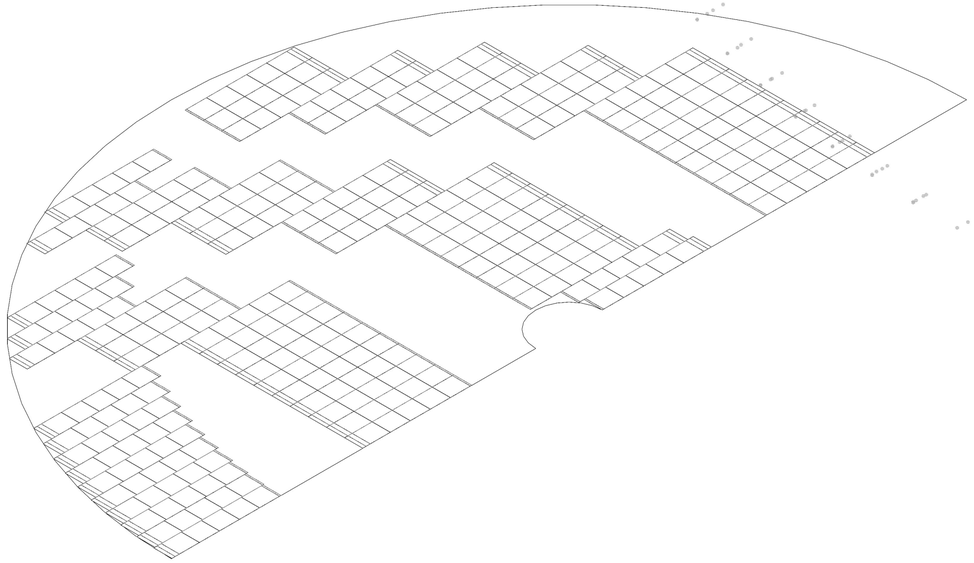




Simplest form and algorithm?

Disk concept — Tiling

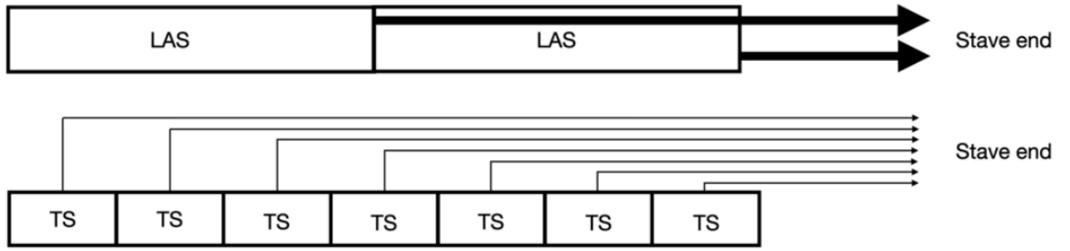




It will certainly have acceptance holes, though not from the (main) peripheries,
Some concerns from the engineering side,

Nevertheless, use this as a basis for comparative evaluation going forward?

Concepts — Services



Jo Schambach (re-)raised what the impact would be from a single-sensor approach, now in a context of 1—2 EIC-LAS variants.

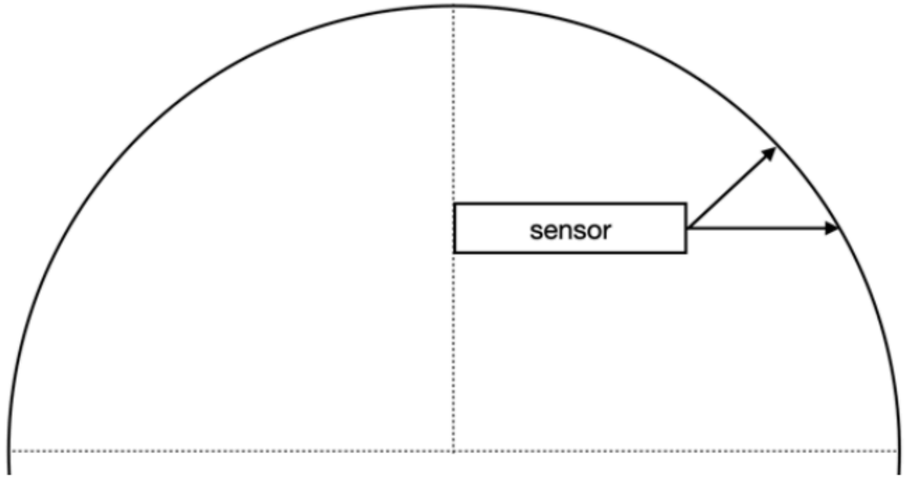
Multiple effects at play.

Model evaluation:

- “what if EIC-LAS has a service load that is six times larger than for a single sensor (TS)?”

- “what if EIC-LAS has n RSUs?”

At least a 35% (20%) improvement for n = 6 for the OB (ED,HD) with these assumptions.

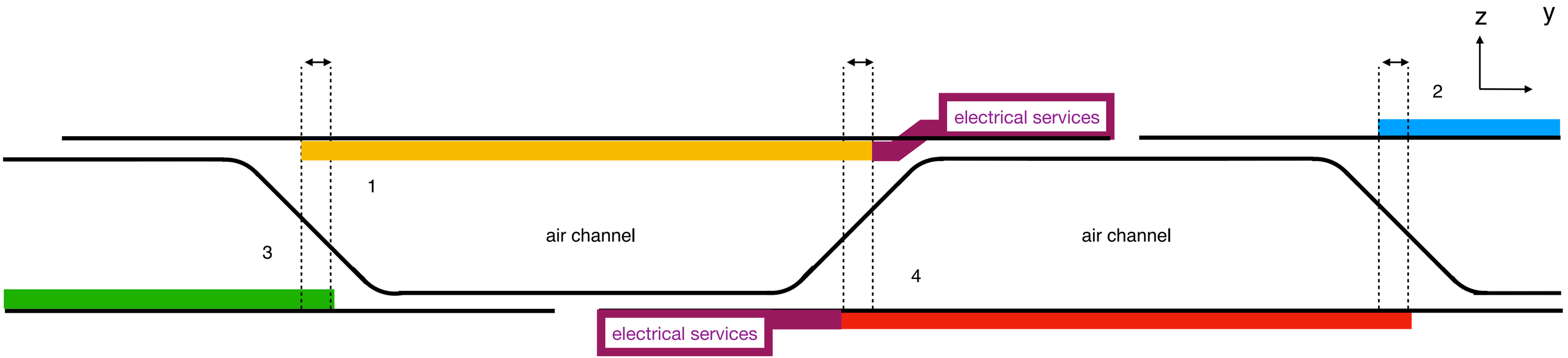


Notes added after the meeting (ES):

1. Service load here means inactive material contributing to X/X_0
2. The factor six is a (conservative) guess taken from the number of readout links before reductions from R&D. Powering is another contributor to services and is expected to contribute more than readout. The factor of six is thus conservative.
3. A lower value for this factor means a larger gain (reduction) in material compared to single sensors.

Disk concept — Alternative

While the concept on the preceding slides “seems simple,” we are investigating alternatives:



Having a sensor module part of the face-sheets — as shown here — would seem preferred,

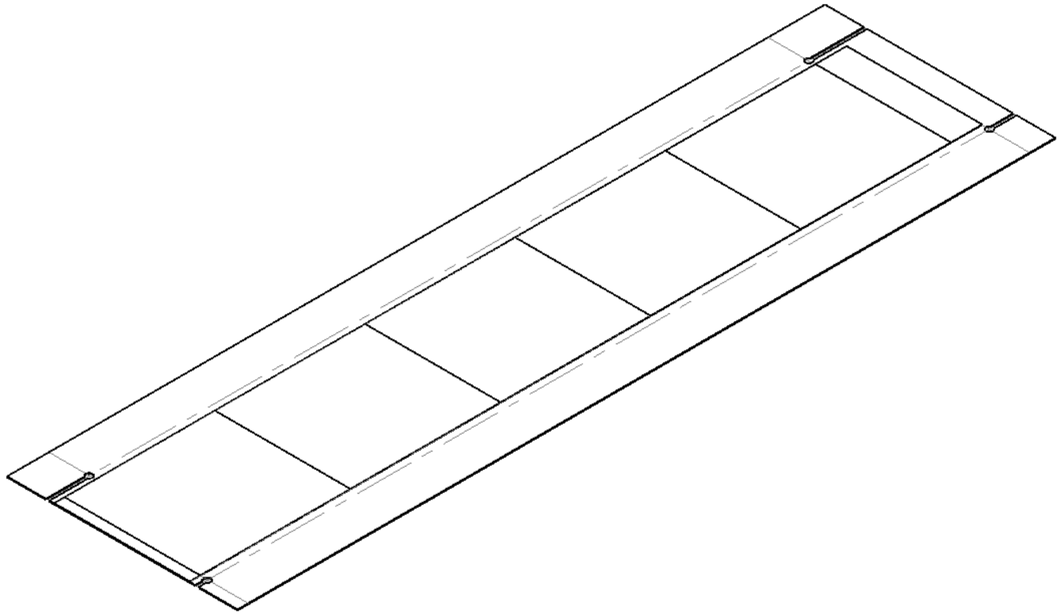
Arguments include that services can be guided to areas with mechanical support

Two module sides or heights would thus result in *four* sensor planes on the disk — color coded above

Module concept

A “module” could have one or more sensors on either or both sides,

In its most rudimentary form, with one EIC LAS only, it might look something like this:



Note that the EIC LAS sensor here has five RSUs and peripheries on both sides. Its support extends slightly beyond the main periphery (likely needed for bonding) and the slots would allow for overlap along the length axis (provided the materials are all thin enough or the structure is not entirely flat).

Disk concept — module placement