EIC-LAS: Discussion on workforce

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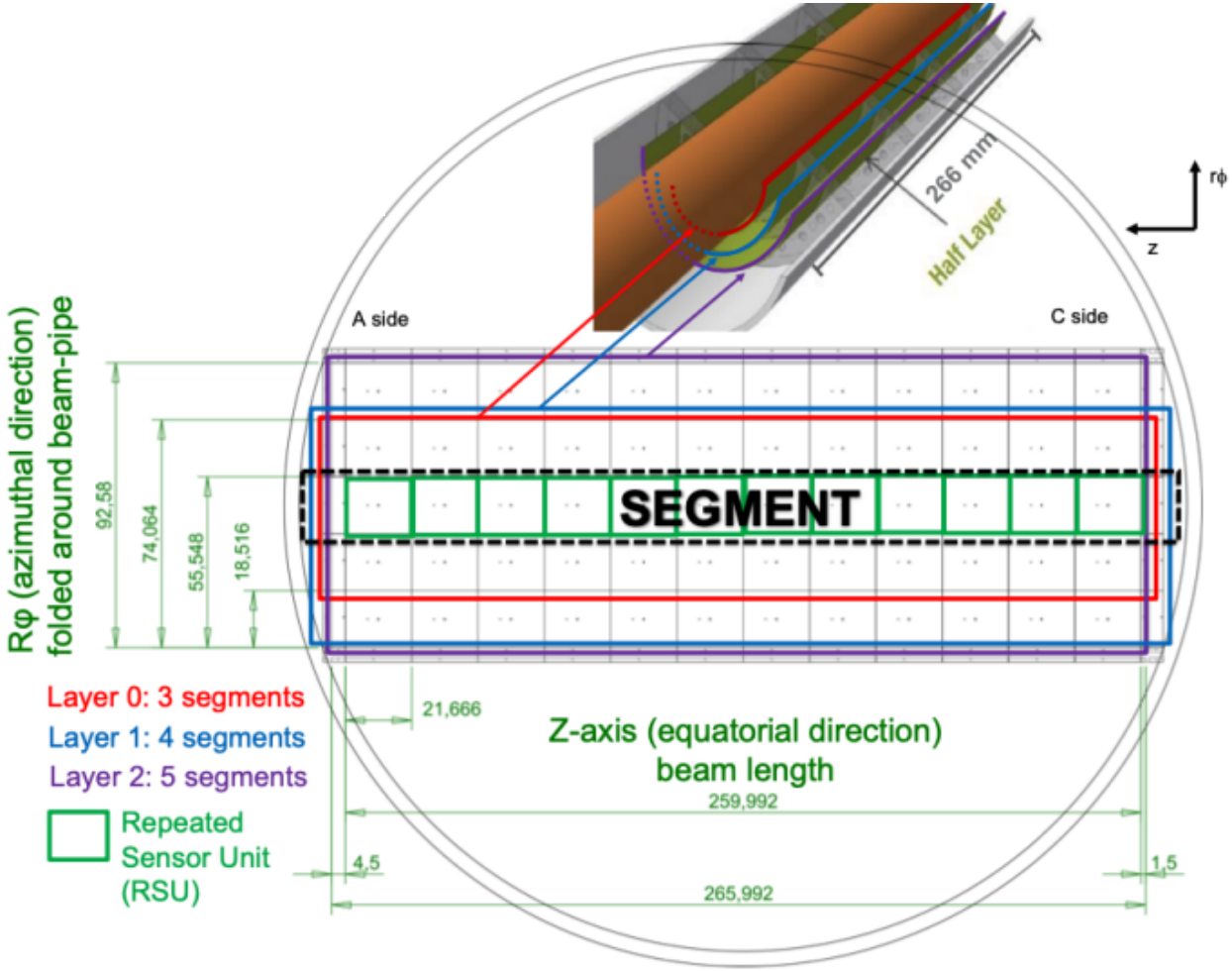
MOSAIX

MOSAIX (ER2) - Sensor Dimensions

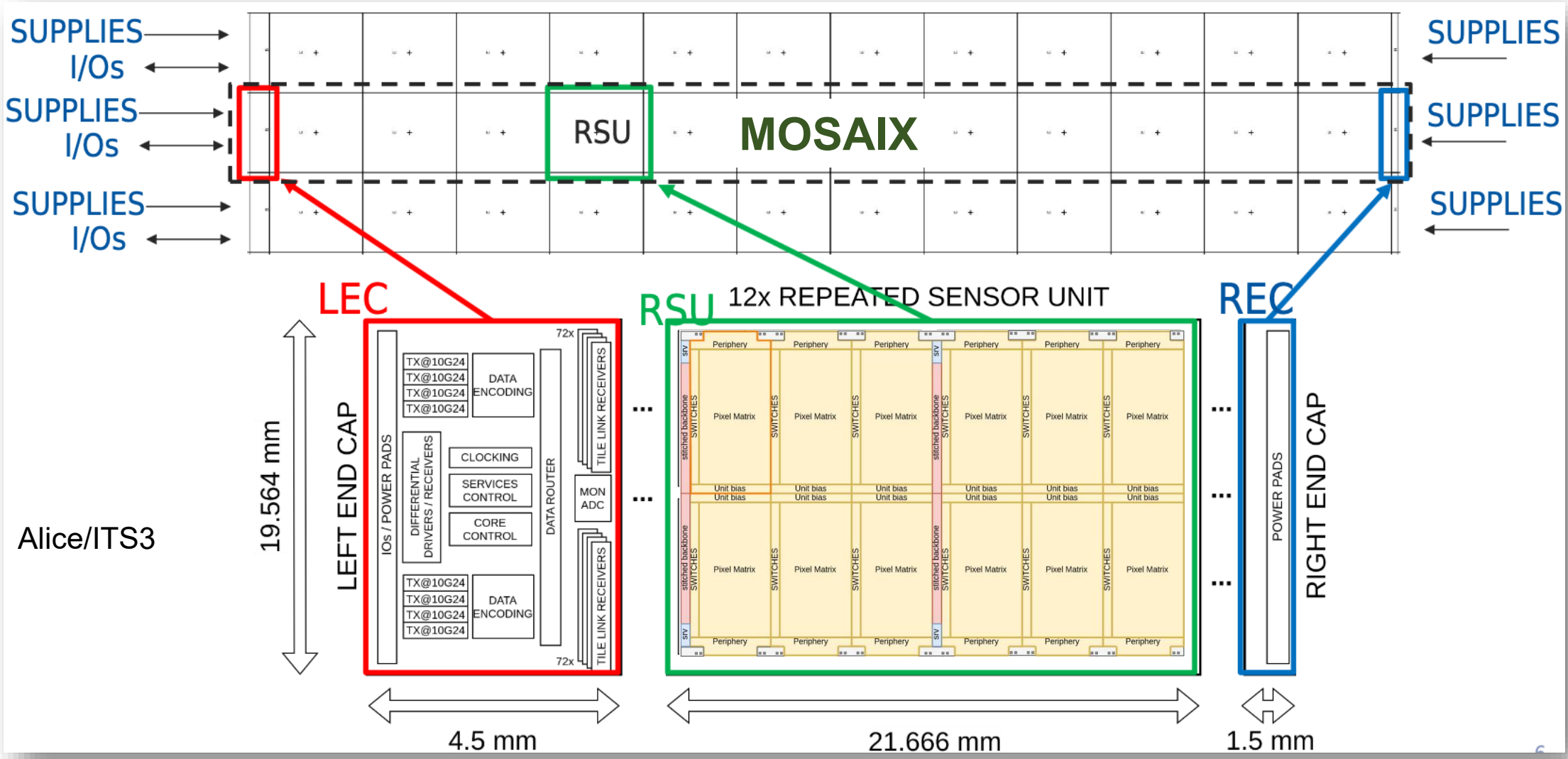
- ❑MOSAIX is a full feature prototype of the sensor for ALICE ITS3
- ❑Wafer scale sensor design using the stitching technique
- ❑Process: TPSCo 65 nm CMOS Imaging Sensors(customized)

- ❖MOSAIX design leading to production sensor (ER3)

Alice/ITS3



MOSAIX (ER2) - Top Integration Diagram

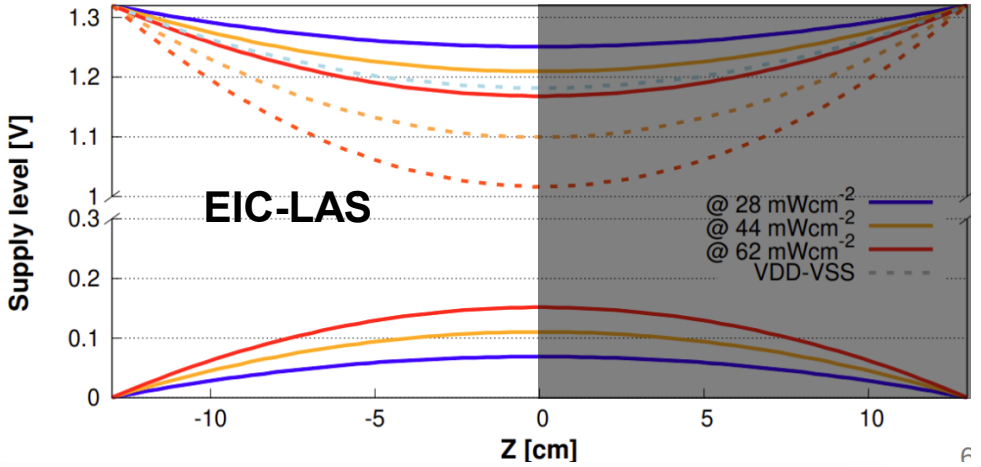


Alice/ITS3

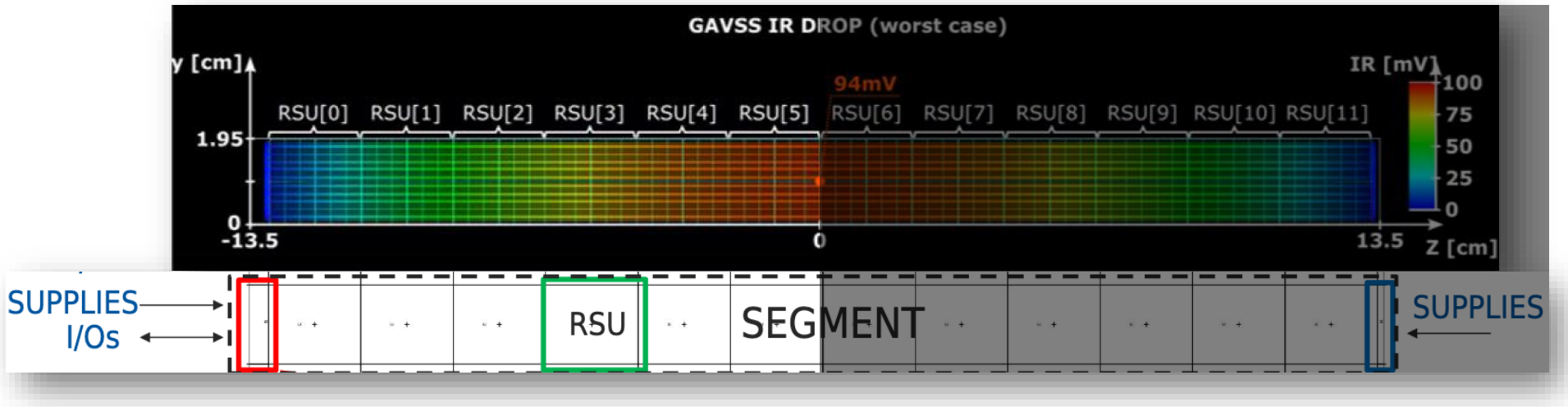
MOSAIX to EIC-LAS

EIC-LAS: Reducing from 12 to 5-6 RSUs

- EIC-LAS (SVT OB & Discs):
  - **Powering** applied **only** from the LEC.
  - Expected similar IR drop @RSU-5 ?

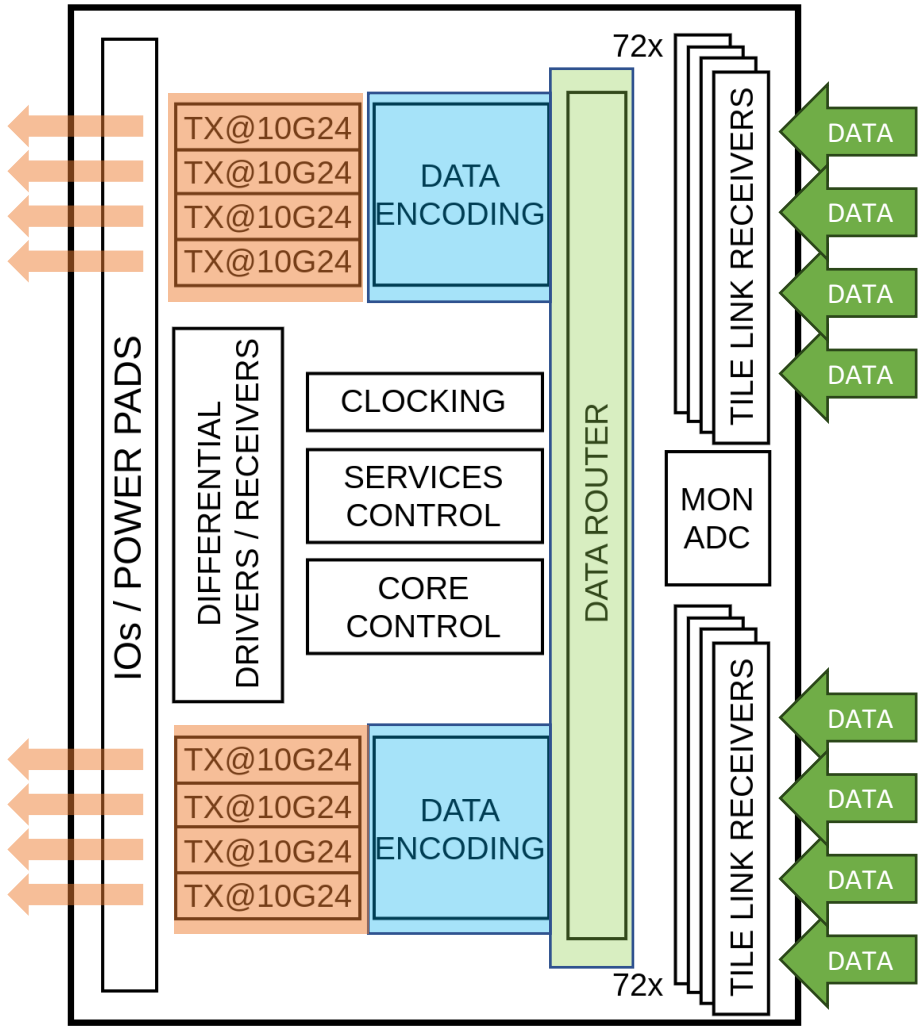


EIC-LAS



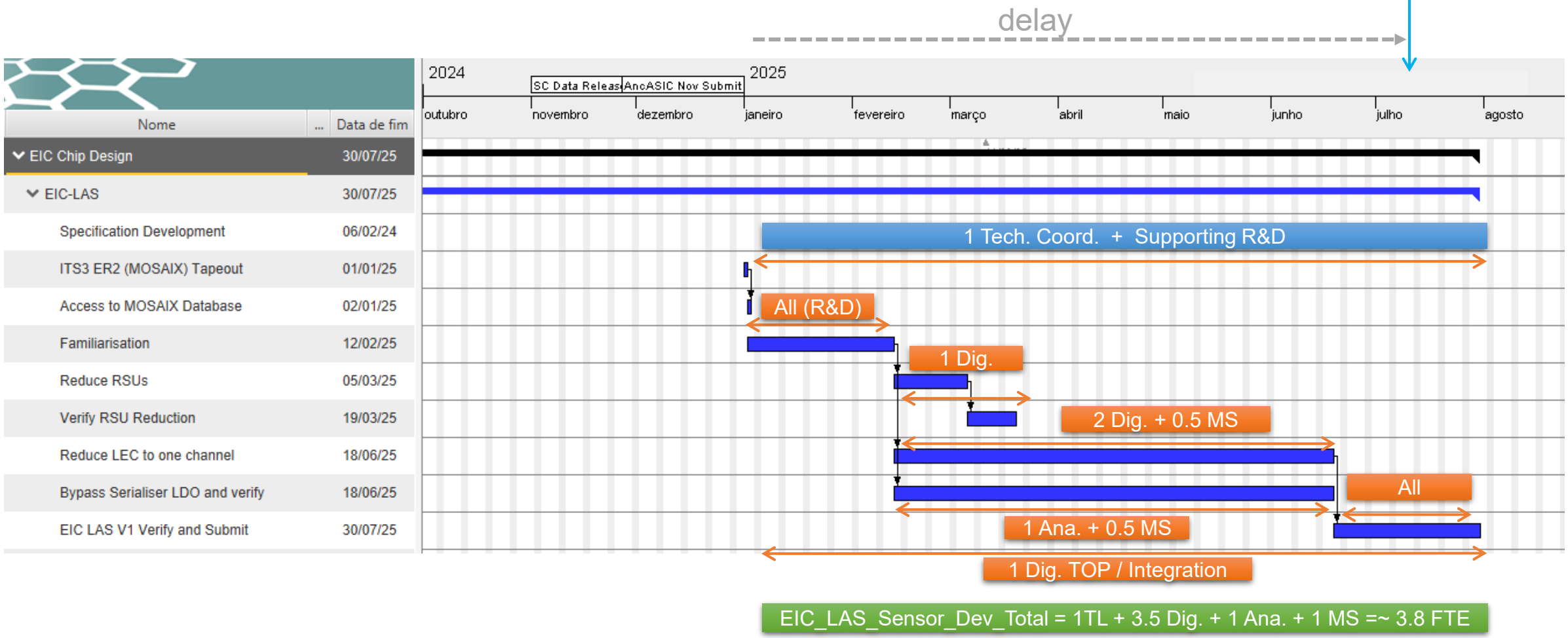
MOSAIX to EIC-LAS : LEC Modifications

- Reduce LEC to one channel
  - Bypass Serializer LDOs
    - Study on the performance before and after removing LDOs.
    - Dedicated decap cells, star routing (supply), and functional adjustments (no LDO controls).
  - Data **Encoding** and **Router** (serialization of the data to a single channel)
    - Challenge to adapt/change
    - Slow control needs to be modified



Preliminary Resources

MOSAIX Tape-out (expected)



Preliminary Resources and Tasks

- EIC-LAS Sensor Development (~7 months)
  - ❑1 Technical Lead that also supports R&D / Design
  - ❑1 Digital engineer for Top / Integration
  - ❑Reduce the number of RSUs
    - 1 Digital engineer (half period) to reduce RSUs and to validate the signal/data integrity (of each RSU).
  - ❑Reduce LEC to one channel
    - 2 Digital engineers plus 0.5 mixed signal engineer. SC control needs to be modified as well as the serialization of the data to a single channel.
  - ❑ Bypass Serializer LDOs
    - 1 Analog engineer plus 0.5 mixed signal engineer. Study on the performance before and after removing LDOs. Dedicated decap cells, star routing (supply), and functional adjustments (no LDO controls).
  - ❑ Final checks and tape-out
    - All team. Functionality, filling, final DRC checks, and submission.

Summary of Key Points

- ER2 submission imminent (aiming for the 2nd week of Jully)
  - ER3 (production) submission scheduled ~1 year after ER2 submission

- EIC-LAS Sensor Development (~7 months)
  - Reduce LEC to one channel
  - Bypass Serializer LDOs
  - Final integrity checks and tape-out

- Importance of Agreement for Access to the MOSAIX Database
  - Full access to all technical details is still pending
  - Work on EIC-LAS cannot begin until database access is available
  - Accurate estimates of the effort and timeline for EIC-LAS modifications depend on complete technical information

MOSAIX to EIC-LAS
Timing Improvement!?

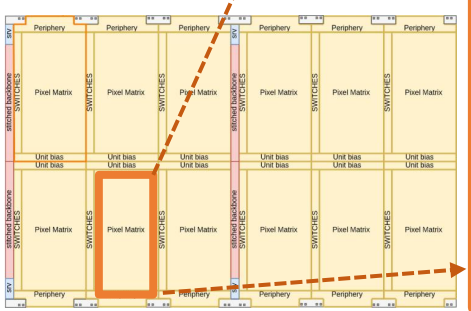
MOSAIX to EIC-LAS: Timing Improvement

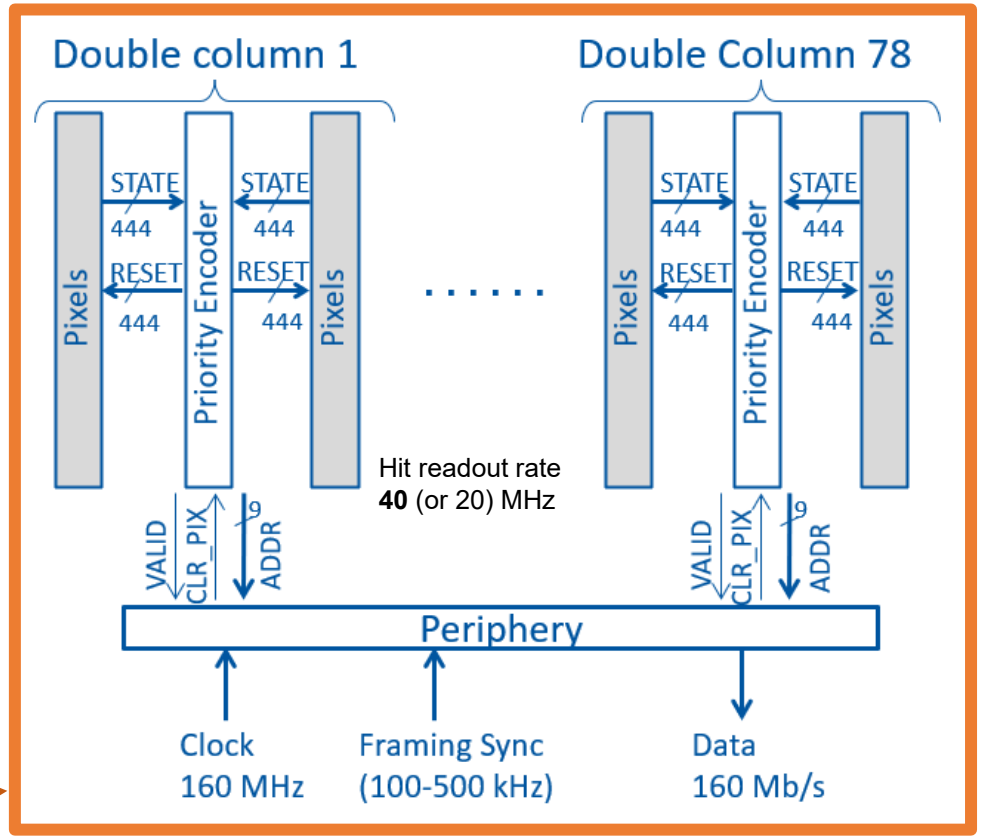
❑Pixel Array Readout

- ➢ Serial transmission of tile packet to LEC
  - ➢ Tile periphery builds and transmits one data packet for each framing interval (2-10 μs)
  - ➢ Global SYNC signal aligns in time the integration intervals across all the tiles

@ 40MHz (25ns) for a 2μs interval, capable of **80 hits** per Tile

For **EIC-LAS**, less hits per Tile?





Alice/ITS3