

R&D requirements of the EIC programme for the UK

Laura Gonella

WP1 meeting

13 September 2023

Why this talk today

- UK Strategic R&D Programme being defined by the UK detector community to get support from STFC and participate in the international DRD effort.
- The PI (Chris Parkes) requested a short presentation on the R&D requirements of the EIC programme for the UK at the next meeting of the steering board (end of the month).
 - Understand the need of upcoming experiments and upgrades to see where there are synergies with the UK strategic R&D programme.
- Peter and I will prepare the talk together and we will both attend the meeting.
 - WP1 R&D needs to be discussed/collected today.
 - Information on WP2 and WP3 requested from colleagues at Glasgow and York.
- The EIC presentation will be paired with an ALICE 3 talk (by Roy?).

R&D needs

- MAPS sensor
 - Pixel pitch $\leq 20\mu\text{m}$, power $\leq 20\text{ mW/cm}^2$, frame rate $\leq 2\text{ us}$
 - Stitching and 300 mm wafers for low mass, bent layers
 - 65 nm CMOS
 - Radiation hardness not a concern
 - Baseline choice: ITS3 large area sensor & EIC LAS sensor derived from it
- Low mass requirements for structure and services
 - 0.05% X/X0 – curved layers, air cooling
 - 0.24%, 0.55% X/X0
 - Light carbon fiber structures, two-phase cooling
 - Aluminium conductor
 - Serial powering development (Shunt-LDO)
- Any UK infrastructure we might need for development/production/testing of components?

Comments from the meeting

- Highlight opportunities to dock together the two programmes
- Low power demonstrator
 - Demonstrator with application
 - Ideas from programme could flow from this
- ITS3 sensor development
 - New technology, stitched, wafer-scale
- DAQ?
 - Not resources in IF

Backup

Proposed structure of the talk

(Short talk, plan for 10 minutes, while waiting for more info)

- Short intro to UK EIC project – 1 to 2 slides
 - Funding, institutes, work ongoing/planned
- ePIC detector and where UK contributes – 1 slide
- Important EIC project dates – 1 slide

- R&D needs: WP1, WP2, WP3 – 6-ish slides

- Backup slides with more info on EIC project and ePIC