

Liverpool: Interest for future R&D on Silicon Tracking and Vertexing

Current and planned activities on sensor R&D, the optimisation of silicon detector integration aspects and application development.

The target applications are:

- high energy collider experiments (LHCb, GPDs, heavy ions, future ee/eh/hh, ...)
 - radiation tolerance / rate / position and time resolution / cost per unit area
- And also non-collider lower energy precision experiments (Mu3e-I, Mu3e-II, future muon/EDM experiments,..)
 - low mass / rate capability / position and time resolution

Liverpool R&D activities/plans

HVMAPS development:

- Design optimisation for radiation tolerance, speed and pixel size .
- Integration/assembly solutions for low mass and cost efficient manufacture.
- Generic technology development within RD50 and hopefully in the new DRD collaboration.
- “In house” generic R&D: submissions with foundries such as LFoundry focussed on optimisation specific design aspects, which are beyond the scope of application driven design development.
- Future collider experiments: focus on development MightyPix and deliver Mighty Tracker with collaborators.
- Non-collider applications: Mu3e (MuPix), Mu3e-II upgrade and other future experiments.

Blue sky R&D: Fully digital sensor for sub-micron position resolution

- Continued development beyond first demonstrator prototypes.
- Optimisation for efficiency and pixel size.
- Application development

Instrumentation for Proton Beam

- Beam characterisation and treatment modelling/validation
- Bragg peak scanner
- planar sensors , neutron sensors and custom developed HV-CMOS chip

Non sensors specific development work on mechanics, services and assembly

- Low mass supports with integrated services
- Low mass electrical services
- Parylene coating
- Efficient assembly methods for large area MAPS arrays (synergy with work on SiPM arrays for future Argon/Xenon TPCs)

Not strictly for tracking or vertexing: optimisation of SiPM sensors.

- Development sensor and sensor array assembly methods and services for minimal radioactivity