



LOW Q^2 TRACKER STATUS

TIC meeting

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Various collaborators

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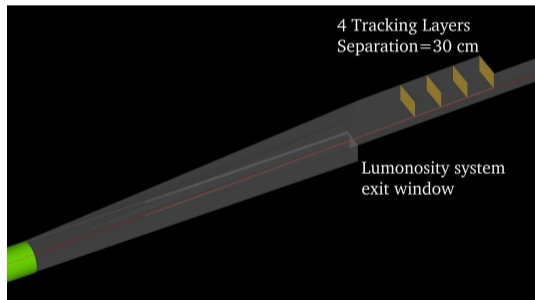
DETECTOR CONFIGURATION

Configuration currently in ePIC simulation

Idealised detector.

All detector layers in beam vacuum.

Cover acceptance larger than possible.



Updated default configuration

Including some integration considerations.

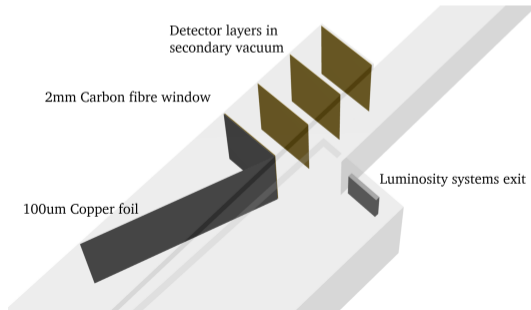
Detectors in secondary vacuum.

2 mm Carbon fibre exit window @ 90 degrees to beam.

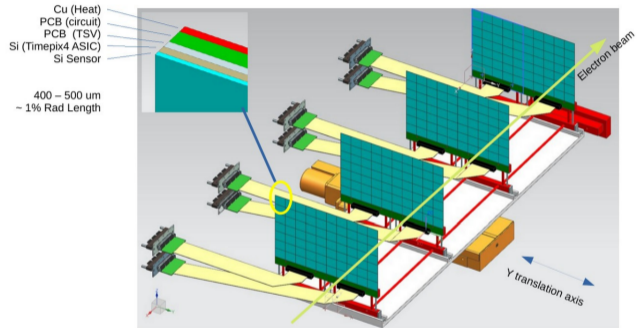
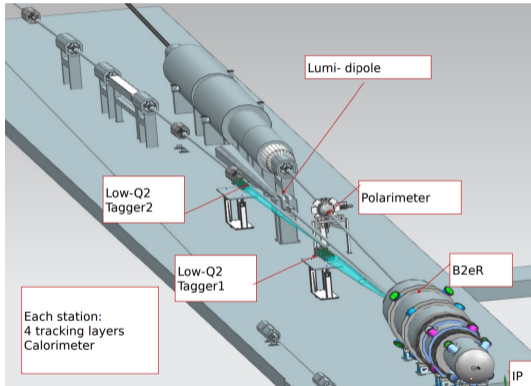
100 μ m foil @ 30 degrees to beam.

Lots of optimisation studies still required.

Beam impedance not yet studied just given guidance.

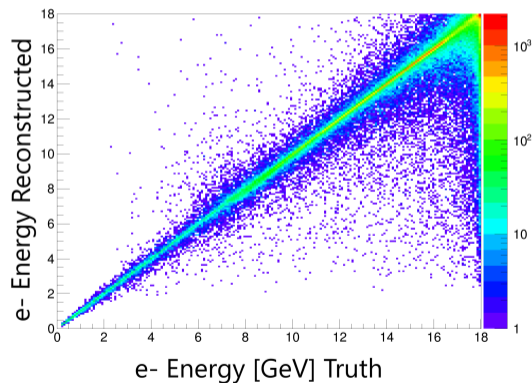
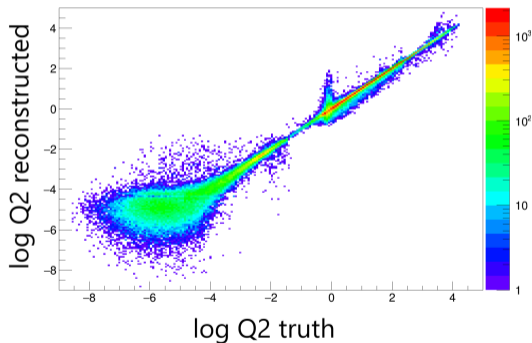


DETECTOR CAD



EVENT RECONSTRUCTION

Basic implementation, agnostic to changes in the detector configuration.
Neural Network converts detected electron track to original scattered vector.
Further work needed on track construction when multiple sources included.



Both updated detector and reconstruction could be included for the July campaign.
Help to improve/test different implementations would be most welcome.

Electron Beam Gas

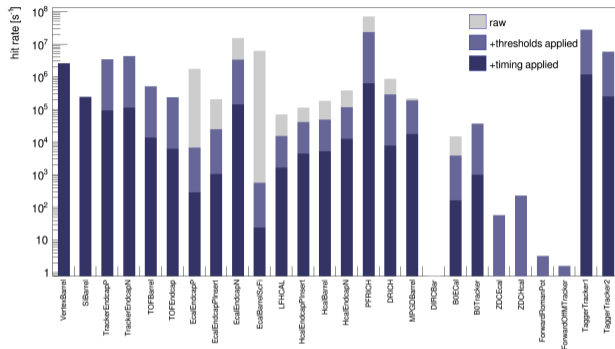
Bremsstrahlung from electron beam and residual vacuum.

Low-Q2 tagger rates \simeq Quasi-Real photoproduction.

More spread out in the y on the detector plane.

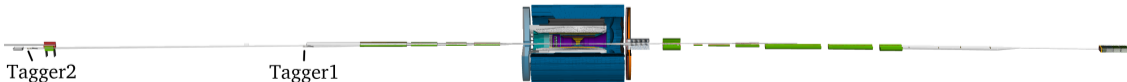
Unlikely coincidence with central detector "event trigger".

Events originating along outgoing beampipe need including.

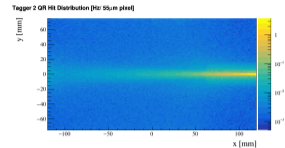
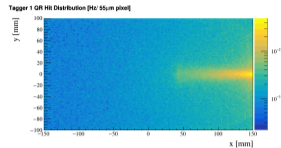


Not yet included

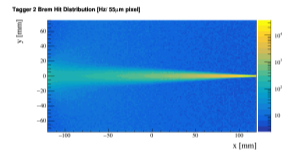
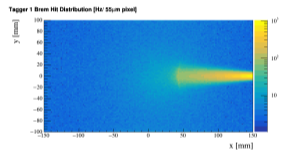
Included



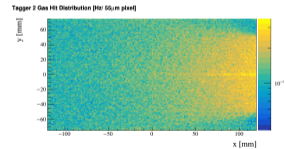
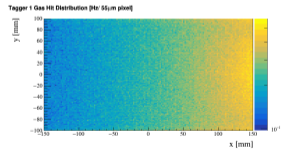
Quasi-Real Photoproduction



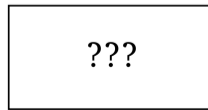
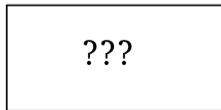
Bremsstrahlung



Electron Beam Gas



Synchrotron



Timepix4

Timepix4 ASIC.

Thin silicon sensor $\sim 50\mu\text{m}$.

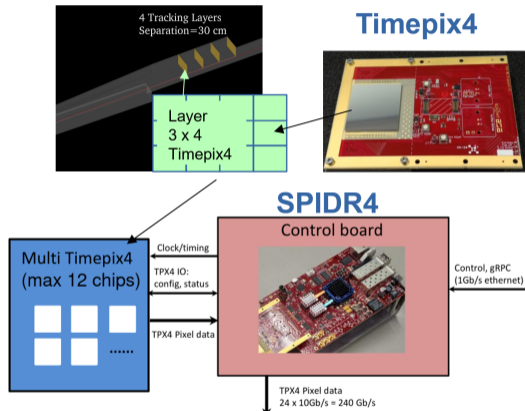
Appropriate rate capabilities.

Good spatial resolution $55\mu\text{m}$ pixel.

Sub beam bunch timing resolution ($\sim 2\text{ns}$ currently limited by sensor).

Rates from synchrotron and separation technique unknown.

Need to determine radiation load and tolerance.



INCOMPLETE TODO LIST

- Update default geometry - More or less ready to merge.
- Include reconstruction into ElCrecon.
- Improve reconstruction implementation.
- Extend beam gas events into far-backwards region.
- Detector benchmarks and optimization.
- Workflow to keep track of beam settings through simulation chain.
- Determine required cooling, power and data services.
- Full readout data processing chain.
- Synchrotron event sample.
- Impedance studies on current design.
- Begin detector tests.

More or less ready

In progress

Early stages

Planned - Needed to progress design