Far-forward/backward detectors: Glasgow & York

University of Glasgow: Daria Sokhan (daria.sokhan@glasgow.ac.uk), Ken Livingston, Derek Glazier, Simon Gardner, Dima Maneuski, Rachel Montgomery, Bjoern Seitz + new postdoc.

Current Timepix R&D is in collaboration with the Daresbury Laboratory.

University of York (ex-Edinburgh group): Dan Watts (daniel.watts@york.ac.uk), Mikhail Bashkanov, Stuart Fegan, Nick Zachariou + PhD students

Strong record in low-Q^2 tagging:

Glasgow & York designed and constructed, in part or as a whole:

- the Mainz "Glasgow tagger",
- the JLab Hall B tagger,
- the forward-tagger (hodoscope) in CLAS12 at JLab: 230 elements - SiPMT, 6 metre optical fibre readout.

Open Mic session - EIC@IP6: kick-off meeting - 12-13 March 2021

Timepix-based detectors (Glasgow)

Timepix – hybrid pixel detector technology developed by the Medipix Collaboration (Glasgow one of the founding members).

Timepix4 capabilities:

- Compact & radiation-hard
- High spatial resolution: < 50 μm
- Timing resolution: in combination with fast sensors (eg: LGADs) can reach < 100 ps
- Ideal for small-area detectors

Possible applications:

- Low-Q^2 tagger, in combination with calorimeter, to improve separation between electrons and photons.
- Off-momentum / B0 spectrometer (*possibly ZDC although its area may be too large*).

Possibility of combining Timepix4 with a radiation-hard **quartz Cherenkov counter**: timing resolution of < 50ps achieved in tests with MCP-PMTs (before Timepix).

Other ideas (York)

In addition to collaboration on a low-Q^2 tagger, York has expertise and interest in the following applications to EIC detectors:

Polarimetry:

* Track-record: designed & constructed large acceptance nucleon polarimeter for MAMI@Mainz (Implementation of polarized nucleon scattering into Geant4)
* Proof-of-principle stage for large-scale room temperature nucleon spin polarized detector/scattering media – possible application @ EIC?

Possibility of combining polarimeter material with Timepix for high pixelation (*in collaboration with Glasgow*): R&D required.

Low-energy photons from nuclear decay:

Led recent developments in realization/simulation of nuclear decay gamma tagging in photonuclear reactions (0.1 - 1 GeV photon energy): potential application for EIC detector design.

Looking to identify the detector subsystems to which we can contribute!