

ESPP: initial thoughts from WG4

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Some Open Topics

... including both consolidation and
'from scratch' addition of new capabilities

Paul's slide from
the Feb 2024 Synergy WS

Design / simulation code base development

- Common framework to investigate (integrated) detector response

 possible extension

Detailed synchrotron radiation simulations

- Explore impact on inner regions more thoroughly

 our activity (first meeting tomorrow)

Optimising technology and layout of detectors near beamline

- Inner tracker technology / layout (Fluences? Sensor placement close to the beam)
- Forward / Backward instrumentation fully integrated with the IR design



Adding Particle ID capabilities (Cerenkov, TOF)

- (p_T / η) ranges / technologies to connect with EIC SIDIS and physics in AA
- Compromises with respect to other detector components?

Developing a Trigger / DAQ scheme

- Understanding the physics and background rates
- Obtaining a (triggered or streaming) concept for data acquisition

Review aspects of the detector 'inherited' from ATLAS?

- Are calorimeter and muon designs really ideal for use in ep / eA?

LHeC versus FCC-eh

- Implications of higher energies ... 'same again only bigger', or smarter?

A joint detector eh and hh detector?

- Technical challenges in simultaneously serving e-h and h-h studies
- Opportunities for cross-calibration and systematics reduction

WG4: current activity and possible contribution to ESPP docs

- The synergy workshop outcome:
 - We need to estimate the impact from the SR, as studied by Laurent and the accelerator team, to our detector, by simulating the absorption/reflection
 - First meeting with Peter Kostka, Laurent and Krzysztof tomorrow on 18 Apr
 - to understand the technical issues in interfacing the simulation by Laurent to LHeC DD4Hep simulation
- Ideally we like to extend the study to:
 - layout optimisation of the silicon tracker close to the beam AND the shape of the beampipe
 - including possibility of placing the innermost layer in "second vacuum" to make the inner beampipe thinner
 - creating a repository for the LHeC detector simulation code
- Tentative goal: to present first result on the impact from the SR to the detector
 - better if we could state semi-quantitatively that we have no show-stopper
 - **possibly a section in an ESPP document**