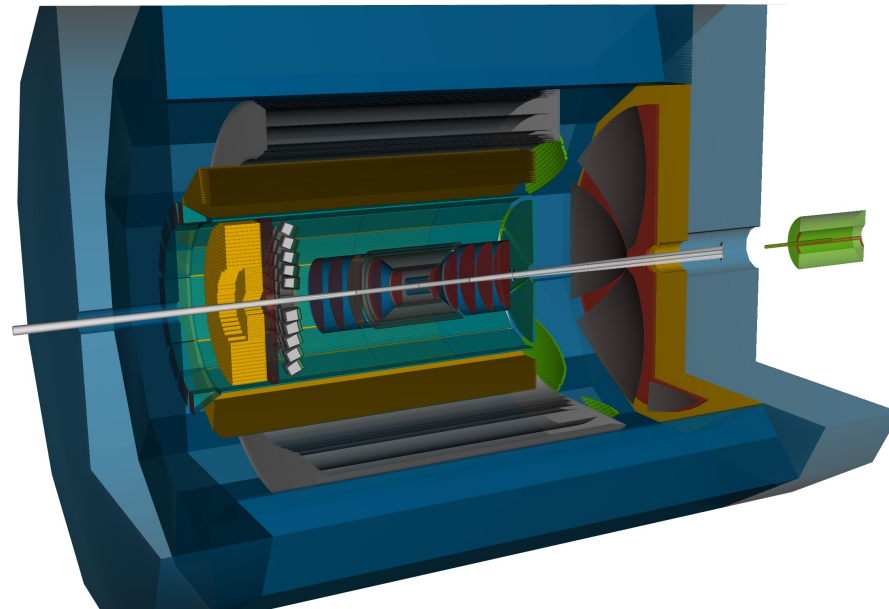




Proposal – Editing Group Report

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Overview

▪ Outline of today's update

Proposal Outline

Detector and Physics sections

- What we have so far

Detector and Physics Templates

- What inputs we are expecting

Timeline

- Where, what, when

Plan for the next 2 weeks

- How

Key message:

Moving into final editing phase

We expect your draft text and figures today (Thursday 14 October)

▪ Proposal Outline (Updated)

Introduction (2 pages)

- Global Design Principles
- Physics Highlights

Detector (25 pages)

- Design Considerations
- Magnet
- Tracking
- Electromagnetic Calorimetry
- Hadronic Calorimetry
- Particle Identification
- Far-forward detectors
- Luminosity and low- Q^2 tagging
- DAQ and Readout
- Software Framework
- Integration Principles
- Upgrade Path

Physics (16 pages)

- Reconstruction Capabilities
- Origin of Spin
- Origin of Mass
- Gluons in Nuclei
- Other Opportunities

ATHENA collaboration

Cost and schedule

Detector and Physics Sections

▪ Detector (22+2 Pages)

Design Considerations (1)

Magnet (2)

Tracking (4)

- Si vertex detector including introduction to next generation pixel detectors (1)
- Si barrel and disks (1)
- MPGDs (1)
- Hybrid tracker (1)

Electromagnetic Calorimetry (3)

- High resolution crystal electron endcap (1)
- Barrel and hadron endcap EMCAL (2)

Hadronic Calorimetry (2)

Particle Identification (4)

- DIRC
- RICH Detectors

Far-forward detectors (2)

Luminosity and low- Q^2 tagging (2)

DAQ and readout (1)

Software Framework (1)

Integration Principles (1)

Upgrade Path (1)

▪ Physics (16+1 pages)

Reconstruction Capabilities (2)

- Kinematic coverage and resolutions (2)

Origin of Spin (5.5)

- DIS at small x with polarised beams (1)
- 3D quark imaging with hadrons (1)
- 3D gluon imaging with HF & Jets (2)
- 3D quark/gluon imaging with DVCS and TCS (1.5)

Origin of Mass (3.5)

- Gravitational FF through DVMP on nucleons (1.5)
- 3D gluon imaging/GPDs with J/ψ and Υ (1)
- Threshold dependence of τ production (1)

Gluons in Nuclei (5)

- Nuclear PDFs and saturation
- DIS & SDIS (1)
- Electro/photoproduction of ϕ (0.5)
- Jet observables and correlations in CNM (1)
- Jet substructure in CNM (0.75)
- Heavy quark probes (0.75)
- Energy loss and transport in dense matter
- Precision probes via SIDIS (0.5)
- Jets and jet substructure probes at small x (0.5)

Other Opportunities (1)

- How hadrons emerge from partons
- DIS at small x with unpolarised beams
- Backward exclusive meson production

Detector and Physics Templates

▪ Detector subsystem

Name, purpose and scope

Technology description

Differences / improvements wrt YR

Expected performance versus requirements

Limitations, if any, for EIC physics

Discussion of risks and R&D needs
(e.g. Is it a well-established technology or an emerging one? Are there commercial off-the-shelf components? What are the risks of operation using this technology? How do you plan risk mitigation, and do you have a backup technology? What is the cost impact?)

Upgrade path (if any)

Note: include at least one performance plot within page limit

▪ Physics topic

State big question addressed

1 paragraph description of the measurement & importance (e.g. White Paper, NAS report, etc..)

Which detector subsystems are essential?

What are the requirements for resolutions, PID?

What are the physics goals of ATHENA for making this measurement

(e.g. precision, acceptance, PID, redundancy, etc)

Species and polarization

Are multiple beam energy/particle combinations needed?

What integrated luminosity is needed for a significant measurement?

Suitable for early (1-3 yrs) physics?

Please draft 1 page per science goal including text and figures (!)

New: Templates now available in Overleaf.
Will share with WG convenors today.
Please use for new contributions.

Notes:

1. We should assume 10 fb^{-1} for year 1, and 100 fb^{-1} per year after ~2-3 years.
This will be split among energy/species combinations run in a given year!
2. Objective is to start with 1×10^{33} luminosity, and grow beyond that
3. Objective is to start with 60% (50%) proton (electron) polarization; ultimate goal is 70% each

Proposal in Overleaf

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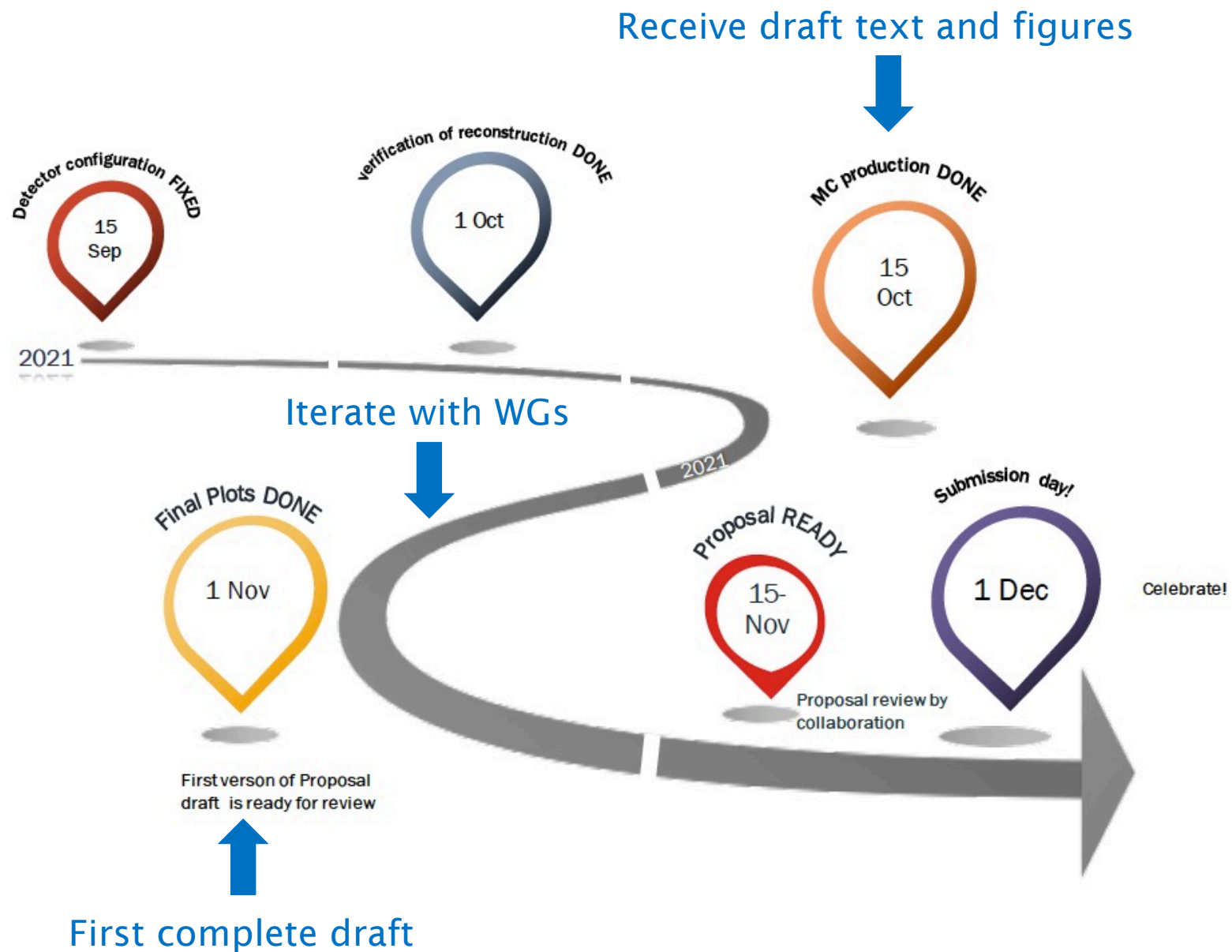
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Note: subsection headings are not final

Timeline



Plan for the next 2 weeks

- We want a first draft of the proposal by **1 November**

Just 2 weeks to go ...

- Plan for the next 2 weeks

Expect to receive all draft text and figures today

Will be asking for pointers to reference material

Incorporate inputs into the proposal

Iterate with Detector and Physics WGs

Editing and harmonising the different sections

- Next steps ...

Send proposal (detector and physics) for external review **early November**

Final edits and collaboration review before submission **1 December**

Detector and Physics WGs

Please send us your draft text and figures or contact us **TODAY**