Muon Collider Collaboration
Interest from the University of Oslo

Erik Adli,
Kyrre N. Sjøbæk
Department of Physics
University of Oslo, Norway

Muon Collider Collaboration Meeting
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General interest

• Understand the potential of the muon collider option
• Apply experience from CLIC to this study
• Investigate overlap with plasma acceleration/focusing research
• Current resources: 1 PhD student (from end 2020) + fraction of researcher + supervision
  – Master students
  – More funding may be sought
• Preferred collaboration model: light-weight MoU (a la CLIC), with contributions pending funding, easy access to CERN
Study/design of $\mu$-linacs

- Study muon linacs, from the cooling to the accelerator ring
  - Detailed numerical studies (level of CLIC). Conceptual design (not technical design)
  - Tool development for integrated simulations. One possible path upgrade working tools from CLIC with muon functionality.
    - Muon decay and production of secondaries needs to be implemented
    - PLACET2? (structure for multi-pass and time-tagging), Elegant?

- Investigate whether plasma acceleration may improve $\mu$-collider performance
  - Higher gradient -> higher muon survival
  - Could parts/all of the $\mu$ accelerator be done with plasma?
    - Can the AWAKE scheme be used for a CERN-based $\mu$–collider
    - For MAP scheme?
    - For LEMMA scheme?

- Relevant experience at Oslo
  - CLIC linac studies/integrated simulations
  - Operational experience with linacs: CLEAR, FACET (tuning and correction of the 2 km SLAC linac)
  - ESS high power proton beam (Norwegian in-kind contributions)
Other topics

Plasma lensing for capture?
• Could muon capture or positron capture profit from the strong, radial focusing of plasma lenses?
• Exploratory topic. Need to understand better the current concepts for muon capture
• Relevant experience at Oslo
  • Numerical and experimental studies of active plasma lenses

Potential synergies with ESSnuSB interests at Oslo?

Potential interest from theory at Oslo?