

# Working group on the use of advanced accelerator techniques CLIC workshop 2018

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# Mandate

## Mandate for working group on use of novel accelerator schemes

- Look at interesting long term perspectives for LC installations
  - potential use of these in Linear Collider implementations as future stages of the existing plans for Higgs factory
  - Could be everything from reuse of tunnel, extend linac, afterburner, improvements of BDS ...
- The studies can also help to identify R&D priorities for novel accelerator schemes by considering their compatibilities with CLIC and ILC technologies.
- Input to European Strategy

# Meetings so far

## Novel accelerator methods as a future stage of CLIC (or ILC)

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February 2018

 09 Feb [CLIC Novel Accelerator Methods: Dielectric acceleration at SLAC \(TBC\)](#) 

December 2017

 15 Dec [CLIC Novel Accelerator Methods: Active Plasma Lenses](#)

October 2017

 13 Oct [CLIC Novel Accelerator Methods: Hollow Channel Plasma Wakefield Accelerators](#)

May 2017

 12 May [CLIC Novel Accelerator Methods: dielectric structure research at ANL/AWA](#)

April 2017


 21 Apr [CLIC Novel Accelerator Methods: requirements from particle physics](#)


March 2017



 24 Mar [CLIC Novel Accelerator Methods: overview of novel acceleration techniques](#)


February 2017

 17 Feb [CLIC Novel Accelerator Methods: linear collider requirements](#)

 Managers

 Erik Adli

 Materials 

 [Mandate\\_for\\_working\\_group\\_on\\_use\\_of\\_...](#)

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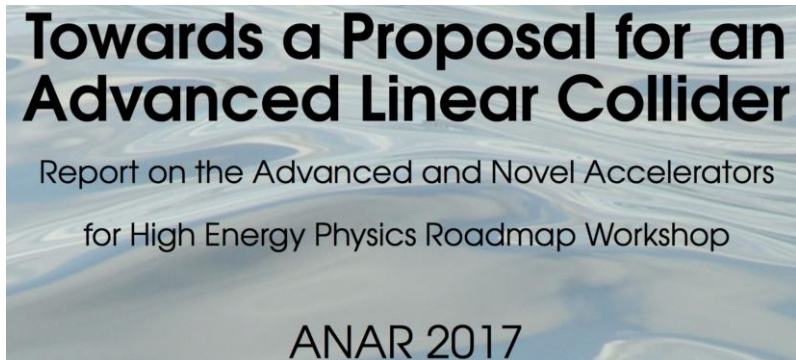
<https://indico.cern.ch/category/8905/>  
Minutes available at the indico pages.

# On-going work: WG and outside

- Optimal use of a different technology, PWFA, LWFA, DLA ... would require a top-level parameter re-optimization of collider design. Early concepts for plasma and dielectrics never did this top-level optimization. A large effort would be required to arrive at **consistent designs, for fair technology comparison.**
- Hard to estimate the upgrade possibilities for main linac as long as optimal use of novel technology for a green field machine is not clear either.
  - Perhaps easier for other parts of the machine (compact focusing, compact injectors etc.)
- **Sufficient design resources a problem.** How to proceed.
- Own opinion: synergies with ALEGRO should be fully examined and exploited

*Talk by Patric Muggli in this session, plus following discussion.*

## ALEGRO (Advanced LinEar collider study GROup)



B. Cros, P. Muggli:

An ICFA ANA initiative.

# Simplistic view of synergy CLIC and ALEGRO?

"Top down approach" This part perhaps underrepresented in the AA community.

Collider design, based on current knowledge (including simulation/theory), fulfilling physics

$$\mathcal{L} \propto H_D \frac{n_{\gamma}^3}{\sqrt{\sigma_z}} \frac{1}{\sqrt{\epsilon_y \beta_y}} \frac{R+1}{R} \frac{\eta P_{wall}}{mc^2}$$

gives input to

Technology development and experiments to address the critical issues

updates/  
inspires

"Bottom up approach" – see what comes out of technology  
Development not necessary driven by linear collider requirements

# Session timeline

16:00

**The CLIC Advanced Accelerator Techn...** *Erik Adli*

**Status of plasma wakefield positron acceleration**

**Progress on active plasma lens technologi in CLEAR**

17:00

**Non-invasive beam diagn...** *Thibaut Lefevre*

**The ICFA ANA Alegro initiative** *Patric Muggli*

**Discussion**

*CERN*

17:50 - 18:00

18:00