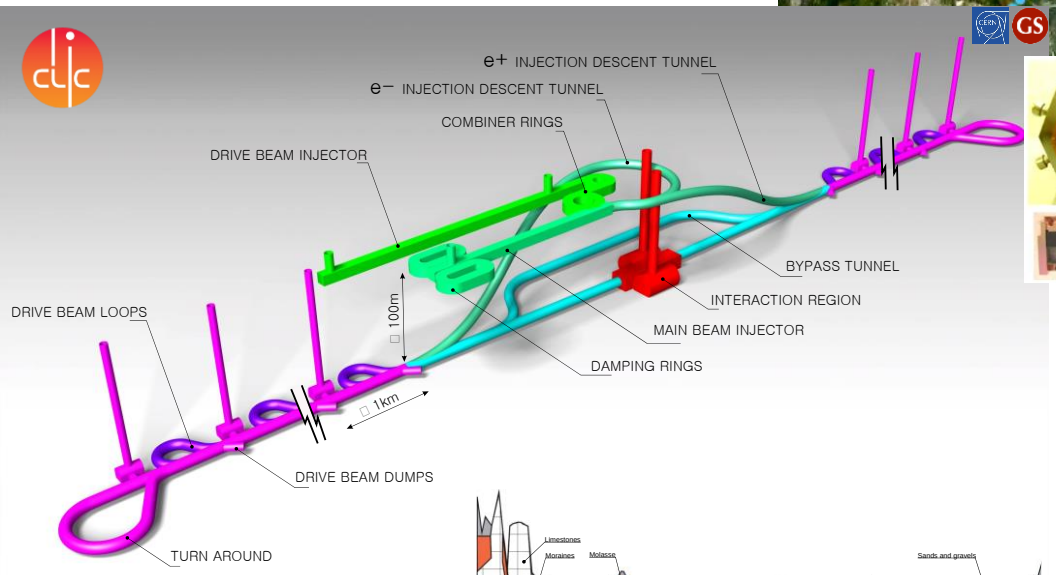
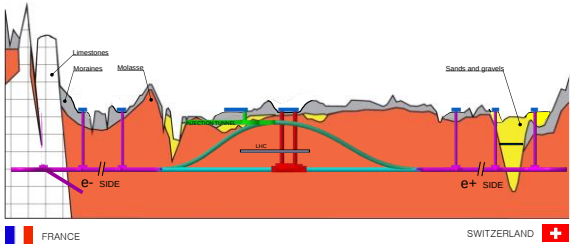
The CLIC project

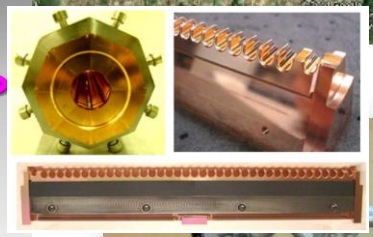
Key features:

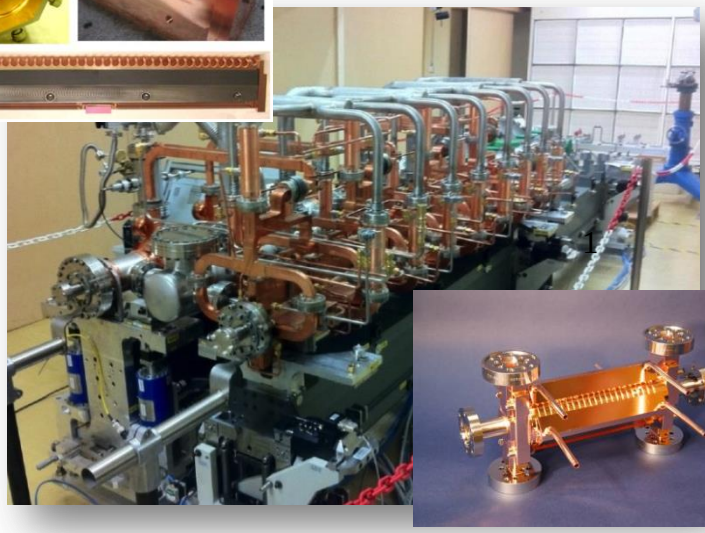
- High gradient (energy/length)
- Small beams (luminosity)
- Repetition rates and bunch spacing (experimental conditions)



CLIC SCHEMATIC
(not to scale)

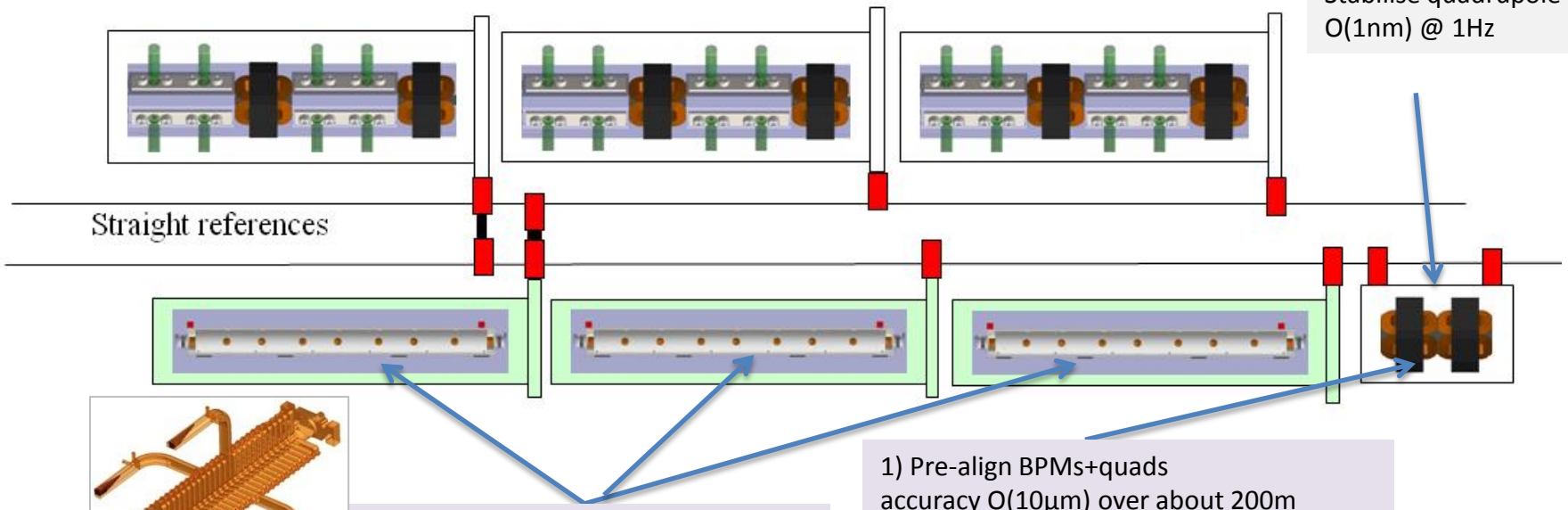






Performance verifications – CLIC

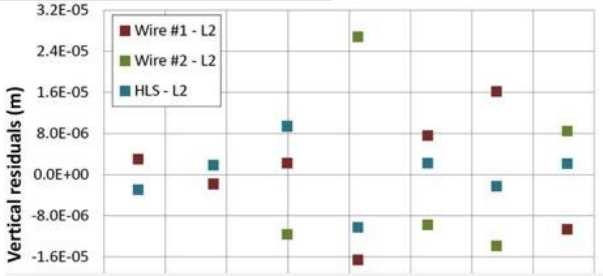
Stabilise quadrupole
O(1nm) @ 1Hz



1) Pre-align BPMs+quads
accuracy O(10µm) over about 200m

3) Use wake-field monitors accuracy
O(3.5µm) – CTF3

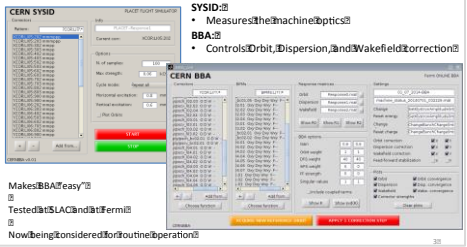
2) Beam-based alignment



•Test of prototype shows
- vertical RMS error of 11µm
- i.e. accuracy is approx. 13.5µm

Our goal: an (almost) automatic correction

We want to make our BBA algorithms as automatic as possible. Two tools have been developed. SYSID and BBA tools



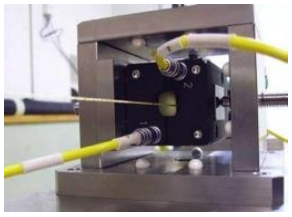
SYSID:
- Measures the machine optics

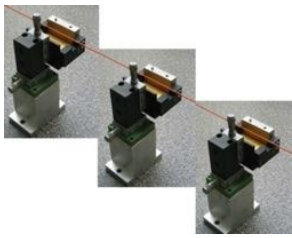
BBA:
- Controls Orbit, Dispersion, and Wakefield correction

Makes BBA "easy"

Tested at SLAC and at Fermi

Now being considered for routine operation



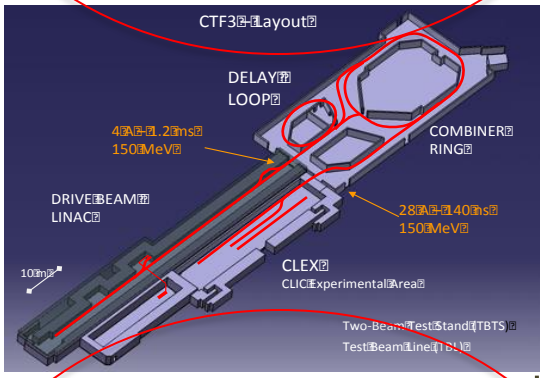


Accelerator collaboration with ~50 institutes
New institutes are joining:
In 2014 SINAP Shanghai and IPM Tehran

Detector collaboration operative with ~25 institutes

2013-18 Development Phase

Develop a Project Plan for a staged implementation in agreement with LHC findings; further technical developments with industry, performance studies for accelerator parts and systems, as well as for detectors.

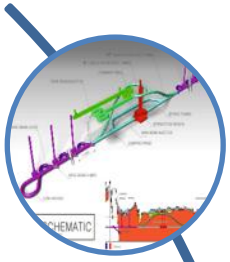


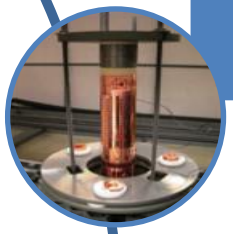
2018-19 Decisions

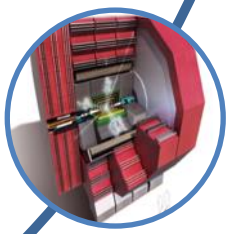
On the basis of LHC data and Project Plans (for CLIC and other potential projects as FCC), take decisions about next project(s) at the Energy Frontier.

- Common work with ILC related to several acc. systems as part of the LC coll., also related to initial stage physics and detector developments
- Common physics benchmarking with FCC pp and common detect. challenges (ex: timing, granularity), as well as project implementation studies (costs, power, infrastructures …)

Main activities







Parameters, Design and Implementation

- Integrated Baseline Design and Parameters
- Integrated Modeling and Performance Studies
- Feedback Design, Background, Polarization
- Machine Protection & Operational Scenarios
- Electron and positron sources
- Damping Rings
- Ring-To-Main-Linac
- Main Linac - Two-Beam Acceleration
- Beam Delivery System
- Machine-Detector Interface (MDI
- Drive Beam Complex
- Cost, power, schedule, stages

X-band Technologies

- X-band Rf structure Design
- X-band Rf structure Production
- X-band Rf structure High Pow
- Novel RF unit developments
- Installation and Operation of High power Te Facili
- Basic High Gradient R&D

Experimental verificatio

- CTF3 Consollidation & Upgrades
- Drive Beam phase feed-forward and feedbacks
- Two-Beam module string, test with beam
- Drive-beam front end including modulator development and
- Modulator development, magnet converters
- Drive Beam Photo Injector
- Low emittance ring tests
- Accelerator Beam System

performance, cost, industrialization, schedule, ..

Technical Developments

- Damping Rings Superconducting Wi
- Survey & Alignment
- Quadrupole Stability
- Warm Magnet Prototypes
- Beam Instrumentation and Control
- Two-Beam module development
- Beam Intercepting Devices
- Controls
- Vacuum Systems

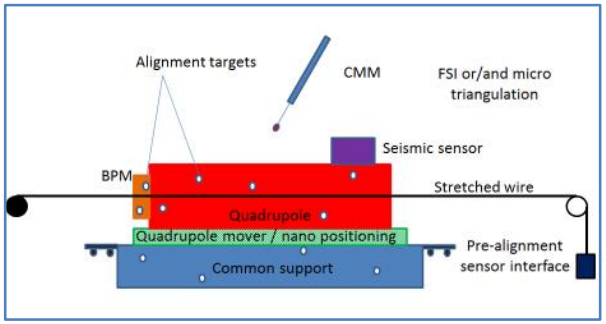
Detector and Physics

- Physics studies and benchmarking
- Detector optimisation
- Technical developments

http://clic-study.web.cern.ch/content/clic-accelerator-activities

Short term: some key issues

- Integration, ultra-high precision engineering and manufacturing
- Magnetic measurements with a vibrating stretched wire (and alternative based on printed circuit boards rotating search coils)
- Determination of the electromagnetic centre of BPM and RF structure using a stretched wire
- Absolute methods of measurements: new measuring head for CMM, combination of FSI and micro-triangulation measurements as an alternative
- Improve seismic sensors and study ground motion
- Nano-positioning system to position the quadrupole and BPM



Long term

- Preparation of industrialization
- Optimization of performances and precision in all domains
- Extrapolation to other components

DMP	ES
ELTOS	IT
ETALON	DE
METROLAB	CH
SIGMAPHI	FR

Hexagon Metrology	DE
National Instruments	HU
TNO	NL

Cranfield University	GB
ETH Zürich	CH
LAPP	FR
SYMME	FR
University of Sannio	IT
IFIC	ES
University of Pisa	IT
Delft University of Technology	NL

CLIC Workshop 2015

26-30 January 2015
CERN
Europe/Zurich timezone

The **CLIC workshop 2015** will cover Accelerator as well as the Detector and Physics studies, with its present status and programme for the coming years.

For the Accelerator studies, the workshop spans over 5 days: 26th-30th of January.
For CLICdp, the workshop is scheduled from Tuesday afternoon January 27th to lunchtime on Friday 30th.

Please register by filling-in the registration form in the left menu.

Preliminary programme:

Common parts:
1- There will be an open plenary session on Wednesday afternoon January 28th, giving an overview of the CLIC project (accelerator, physics/detector), placed in the context of other studies for machines at the energy frontier.
2- A common plenary accelerator/detector&physics Friday morning January 30th.
3- Workshop dinner on Wednesday evening.

Dedicated Accelerator sessions:
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session.
3- A Coll

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1- Topica
sessions
2- The C

We are
presenta

~260 registered (and ~200 talks)

Main elements:

- Open high energy frontier session session (today)
- Accelerator sessions focusing on collaboration efforts and plans 2015-2019, parallel sessions and plenary
- High Gradient Applications for FELs, industry, medical
- Physics and detector sessions on current and future activities
- Collaboration and Institute Boards

1st PACMAN workshop

PACMAN is central for some of the most challenging parts of the CLIC machine – but address challenges central for any Linear Accelerator (and also circular machines)

The CLIC project supports the PACMAN activities and has integrated this support in the our plans the coming years

We are pleased to see the young researchers getting into action and already presenting their work and progress

Good luck with the workshop the coming 3 days