



Compact Linear Collider



Linear Colliders in the HSF

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Introduction

- ▶ Large Data rates (comparable to Belle-II)
 - ~ 18 PB / year raw data at nominal running at ILC
 - High Luminosity option, High Energy option ~factor 4
CLIC ~factor 10
 - Start of data taking ~2029 for ILC, after LHC for CLIC
- ▶ Low-noise environment
 - Many Billions of channels – low occupancy
 - High-precision tracking / vertexing
 - Particle Flow with extreme granularity
- ▶ Mature Collaborations
 - First proposals ~2 decades ago
 - Existing collaborations ~1 decade



Computing

- ▶ Production campaigns mostly using the Grid(s)
- ▶ ILCDIRAC (developed at CERN)
 - LC applications on top of DIRAC
 - used by all LC collaborations
- ▶ Currently in stable state, minimal development needed, mostly user support
- ▶ Computing model still being developed



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Common Simulation / Reconstruction Codes

(thanks to the common event data format LCIO, all of it works in multiple detector concepts)

- ▶ slic / lcgeo
 - GEANT4 – based detector simulation. Standalone. Allows detector description in XML format or code.
- ▶ LCFIPlus
 - Flavor tagging package based on SLD's ZVTOP algorithm
- ▶ PandoraPFA
 - Sophisticated particle flow reconstruction, used throughout the LC community, being adapted for LAr-TPC (LBNE)
- ▶ DD4HEP
 - Unified detector description for both simulation and reconstruction
- ▶ aidaTT (under construction)
 - Pattern recognition / track fitting package



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What would the LC community like from HSF

- ▶ No immediate need to improve computational efficiency
- ▶ If software packages leave the boundaries of a single experiment, support for code hosting / documentation / testing might be useful. (Github might also fill this need)
- ▶ Would take advantage of more efficient simulation (simulation ~3 times as much CPU as reconstruction)
- ▶ aidaTT, DD4HEP developed as AIDA projects
 - Would be interested to develop other components under HSF umbrella, if other experiments benefit from this



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What can the LC community bring to HSF?

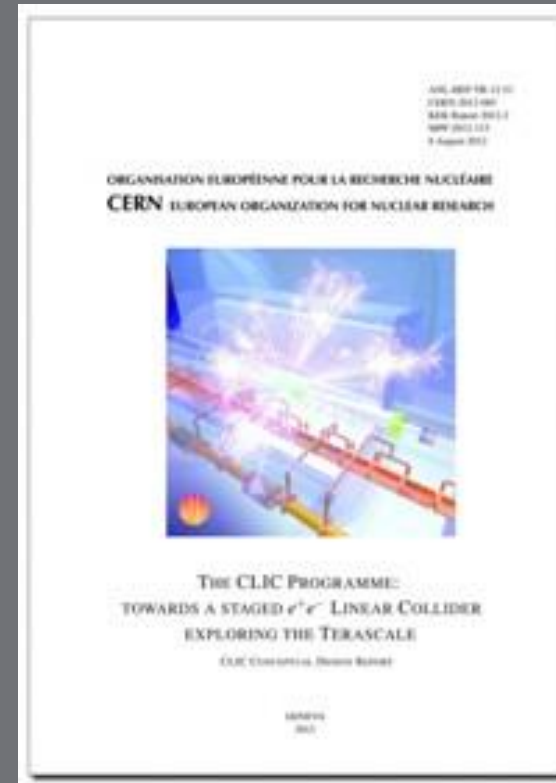
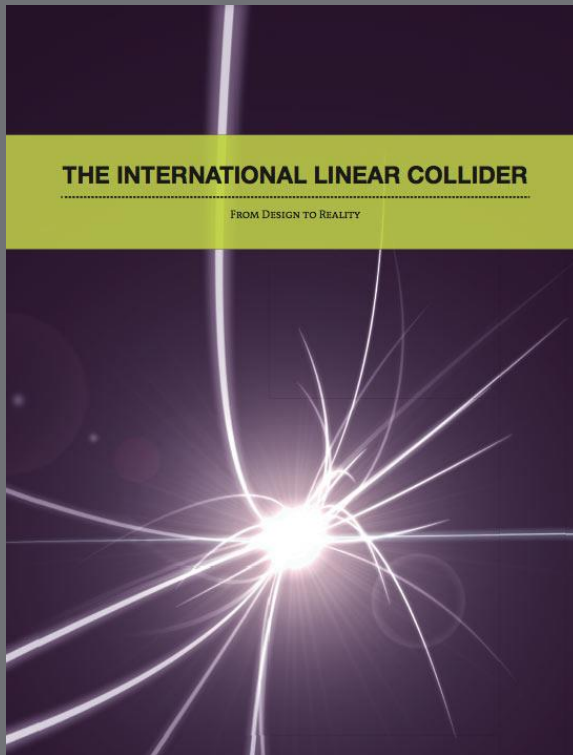
- ▶ Experience in community building
 - Two of the regional detector concepts merged
 - Continuous move towards common software, enabled by common EDM from the start
- ▶ Experience in common / generic software, supporting new users
 - First CLIC detector model in a day
 - First toy simulation events in a couple of weeks
 - Detector concepts (and simulations) are very different, reconstruction software works in all of them (see slide 4).
 - Muon Collider, HPS, ...
- ▶ Open source reconstruction software
 - All of our tools are accessible by anybody



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Linearcollider.org for more information



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