# EPS-HEP 2015

#### Higgs and BSM physics at CLIC

- Speaker: Sophie Redford (CERN)
- Status: Oral presentation, ID 295
- Abstract: The Compact Linear Collider (CLIC) is an option for a future multi-TeV linear electron-positron collider, offering the potential for a rich SM physics programme and sensitivity to a wide range of BSM phenomena. The physics reach of CLIC has been studied for several centre-of-mass energies, allowing a staged construction and providing the ideal scenario for precise studies of the properties of the ~125 GeV Higgs boson. Operation at a few hundred GeV allows the couplings and width of the Higgs boson to be determined in a model-independent manner through the study of the Higgsstrahlung and WW-fusion processes. Operation at higher centre-of-mass energies provides high statistics and the potential to study the top Yukawa coupling. At the highest energy (presently planned to be 3 TeV c.m.) the Higgs boson self-coupling can be accurately measured. The evolution of the physics sensitivity with centre-of-mass energy is presented in terms of a model-independent global fit. The higher energy stages also offer sensitivity to a wide range of BSM phenomena. Within the kinematic limit, new particles can be measured precisely using pair-production. CLIC is particularly well suited to studying weakly interacting states due to the clean experimental conditions and low backgrounds compared to hadron colliders. Indirect searches using precision observables give access to much higher mass scales. Examples for both approaches will be discussed, based on full simulation studies of a wide range of final states.
- Slides

#### Status of vertex and tracking detector R&D at CLIC

- Speaker: Elena Firu (Institute of Space Science)
- Status: Poster presentation, ID 297
- Abstract: The physics aims at the future CLIC high-energy linear e+e- collider set very high precision requirements on the performance of the vertex and tracking detectors. Moreover, these detectors have to be well adapted to the experimental conditions, such as the bunch train structure of the beam and the presence of beam-induced backgrounds. The principal challenges are: a point resolution of a few micron, ultra-low mass (~0.2% X0 per layer for the inner vertex region), very low power dissipation (compatible with air-flow cooling in the inner vertex region) and pulsed power operation, complemented with ~10 ns time stamping capabilities. An overview of the R&D program for pixel and tracking detectors at CLIC will be presented, including recent results on an innovative hybridisation concept based on capacitive coupling between active sensors (HV-CMOS) and readout ASICs (CLICpix).
- Poster

#### Top quark physics at a future linear collider

- Speaker: Roman Pöschl (CNRS/LAL)
- Status: Oral presentation
- Abstract: The International Linear Collider and Compact Linear Collider projects aim to build a linear electron-positron collider with a center-of-mass energy well above the top quark pair production threshold. In this contribution an overview is presented of the potential of their top quark precision physics programme. One of the highlights is a precise determination of the top quark mass through a scan of the center-of-mass energy around the pair production threshold, that is expected to yield a total uncertainty on the top quark MSbar mass of less than 50 MeV. The results of a full-simulation analysis are presented, including a discussion of the main systematic uncertainties. Full simulation results are also presented for measurements of the top quark couplings to the Z-boson and the photon. The anomalous form factors are expected to be constrained to better than 1\%, significantly beyond the expected precision at the Large Hadron Collider. Further new results are presented for the sensitivity to non-standard top quark decays and its interaction with the Higgs boson.

- Slides

---

This topic: CLIC > EpsHep2015
Topic revision: r7 - 2015-07-29 - NaomiVanDerKolk1