

Trainee's Project Report

Job Code	PH2923
Department	PH
Discipline	Experimental Applied Physics
Supervisor	LINSSEN Lucie

Description

CLIC Detector optimisation and hardware development:

Introduction: within the CERN Linear Collider Detector project, we currently perform detector concept studies and detector R&D for a future general-purpose experiment at the 3 TeV CLIC e+e- collider. In general, the detectors shall be capable of providing high-precision measurements in the presence of a significant beam-induced particle background. We also perform targeted detector R&D in a few important development areas for such a future experiment. These hardware R&D activities concentrate on: high-precision and low-mass silicon pixel detector development for the CLIC vertex detector, beam tests of dense hadron calorimetry based on tungsten absorber, time-stamping and power-pulsing technologies for CLIC detectors.

The trainee project will be devoted to the detector development projects for the pixel detector and the calorimeter. In this context, the student will get the opportunity to do basic performance simulations (e.g. using Geant4 or TCAD software tools), to participate in detector construction, laboratory tests, beam tests and data analysis of the results. The pixel project covers many high-tech aspects, e.g. ultra-thin semiconductor sensors, the readout electronics, the interconnects, the ultra-thin mechanical supports, power pulsing and cooling. The hadron calorimeter project involves scintillators and gas detector technologies, applied on a large scale and with new readout features like silicon photomultipliers (SiPM).

Contact person: Lucie Linssen (Linear Collider Detector project leader)

Special Requirements

University degree in physics, including university courses in particle physics.

Programming skills, preferably C++.

Additional knowledge of detector simulation tools (e.g. Geant) will be an advantage.

Training Value



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The project offers the opportunity to a young physicist to acquire a broad knowledge in particle physics and particle detection. The LCD project is currently in a phase where fundamental choices for a future experiment will be made. The trainee will therefore have the opportunity to learn about the core underlying principles driving the concept and technology choices of a large particle physics experiment. The project offers the opportunity to work both on hardware (hands-on) and on software tasks within an active multidisciplinary team. The project is carried within an international collaboration framework.