



Contribution ID: 57

Type: ORAL

R&D on Noble Liquid Calorimeter for Future Collider Experiments

Thursday 10 October 2024 11:00 (15 minutes)

A novel concept for the high granular noble liquid calorimeter optimised for the measurements of electrons and photons at e^+e^- Higgs factories, namely for the Future Circular Collider FCC-ee, will be introduced. The concept is motivated by an excellent performance, stability, uniformity and linearity of the response observed with the past and current noble liquid calorimeters. The design of the electromagnetic calorimeter with straight multilayer readout electrodes allow for fine segmentation which is crucial for advanced reconstruction techniques, e.g. machine learning algorithms, four-dimensional imaging and particle flow. The ongoing R&D studies on the readout electrodes will be presented. The results of the measurements with the first prototypes will be compared with the simulations. The optimization studies of the mechanical structure of the calorimeter and the cryostat, along with the results of the tests on the absorber prototype will be shown. The steps towards the beam test prototype will be discussed. The integration of the calorimeter design in the key4hep software will be presented, together with the expected performance of calorimeter system.

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Session Classification: Parallel - WG3

Track Classification: WG3: WG3 - Detector R&D