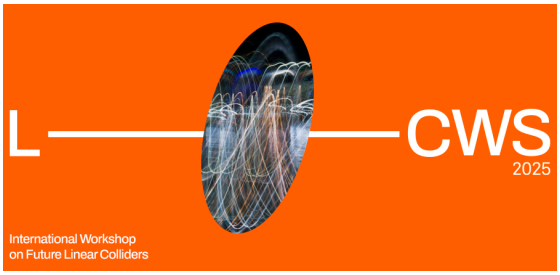

Contribution ID: **8** Type: **Talk**

R&D Studies on Noble Liquid Calorimetry – Cancelled

Noble liquid-based electromagnetic calorimetry is a promising option for next-generation high-precision detectors at future lepton colliders, including potential Higgs factories. Its key advantages —such as excellent energy resolution, uniform and stable response, and the ability to achieve fine spatial segmentation —make it ideal for detailed event reconstruction and control of systematic uncertainties.
Within the Detector R&D Collaboration for Calorimeters (DRD6), current studies focus on advancing both the readout and mechanical aspects of noble liquid calorimeter design. A key element is the use of straight, multi-layer electrodes that enable high granularity, supporting modern reconstruction approaches such as particle flow algorithms and machine learning techniques.
Results from laboratory measurements with PCB prototypes, as well as comparisons with simulation, will be presented. Mechanical R&D includes the development of absorber plates, support structures, and spacers, with emphasis on structural stability and manufacturability. Progress toward a beam test prototype will also be discussed.
As a concrete example, this technology is being implemented in the ALLEGRO detector concept for an experiment at FCC-ee. Its integration with the key4hep software stack and initial performance expectations will be shown.

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