

PD6: Vertexing/Tracking (2 talks)

Mechanical and cooling studies for the inner region of the CLIC vertex detector

Speaker: François-Xavier NUIRY

The strict requirements in terms of material budget for the inner region of the CLIC detector concepts require the use of a dry gas for the cooling of the respective sensors. This, in conjunction with the compactness of the inner volumes, poses several challenges for the design of a cooling system that is able to fulfil the required detector specifications. This presentation introduces a detector cooling strategy using dry air as a coolant and shows the results of computational fluid dynamics simulations and experimental measurements used to validate the proposed strategy. Furthermore, the progress on the development of lightweight detector support structures that fulfil both mass and stiffness requirements are also reported. Optimisation studies and tests of ultra-light full sandwich and open structures (staves) for the CLIC vertex barrel detector will be shown.

Sensor and readout R&D for the CLIC vertex detector

Speaker: Dominik DANNHEIM

A detector concept based on hybrid pixel-detector technology is under development for the CLIC vertex detector. It comprises fast, low-power and small-pitch readout ASICs implemented in 65 nm CMOS technology (CLICpix) coupled to ultra-thin sensors via low-mass interconnects. The power dissipation of the readout chips is reduced by means of power pulsing, allowing for a cooling system based on forced gas flow. This talk gives an overview of recent achievements in the CLIC vertex-detector R&D, with focus on test results with thin-sensor assemblies and readout ASIC prototypes.