

A novel concept of 4D crystal calorimetry for future lepton colliders: R&D highlights

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For future lepton collider experiments, a novel concept of 4D calorimetry based on scintillating crystals has been proposed to overcome performance limits of the existing highly-granularity calorimetry options and aims to achieve excellent resolutions of energy, 3D positioning and timing with the homogeneous structure. The ongoing studies on the detector design and optimisation have been guided by the Geant4 full simulation as well as performance studies with selected physics benchmarks. Hardware development of the detector units is focused on the characterizations with scintillating crystals, the readout with silicon photomultipliers (SiPMs) as well as low-power front-end electronics. This talk will present highlights of the physics performance studies with the crystal calorimeter as part of the CEPC detector and progress on the crystal-SiPM studies.

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