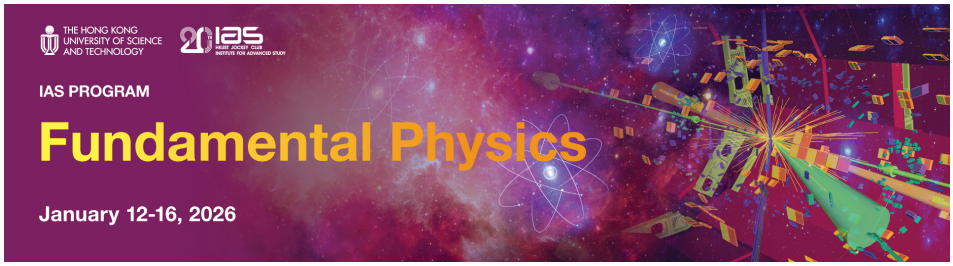

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High-granularity crystal calorimeter for future Higgs factories

Precision measurements of the Higgs, W/Z bosons at future e^+e^- colliders (namely Higgs factories) pose a stringent requirement on the calorimetry system for unprecedented jet performance. At the Circular Electron Positron Collider (CEPC) as one of Higgs factory options, the calorimeter working group has developed a new electromagnetic calorimeter based on finely segmented scintillating crystals to be compatible with the particle-flow paradigm and also to achieve an optimal EM energy resolution of better than $3\,\%/\sqrt{\mathrm{E(GeV)}}$ with the homogeneous structure. It consists of multiple longitudinal layers of long crystal bars that are individually read out by silicon photomultipliers. In every two adjacent layers, crystal bars are in an orthogonal arrangement to gain an effective transverse granularity at the level of $1.5 \times 1.5\ \mathrm{cm}^2$. Dedicated efforts have been carried out to study physics performance, to optimise the design and to develop a first prototype. The prototype was exposed at testbeam facilities using high-energy beam particles to evaluate the electromagnetic shower performance. This contribution will introduce the crystal calorimeter design and performance studies in simulation. Highlights of the crystal calorimeter prototype development and beamtest results will also be presented.

Category of the Submitted Talk(s)

Experiment/Detector

Scheduling Preferences

Author: LIU, Yong (Institute of High Energy Physics, Chinese Academy of Sciences)

Presenter: LIU, Yong (Institute of High Energy Physics, Chinese Academy of Sciences)

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