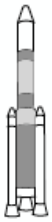

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Full simulation and reconstruction of a segmented crystal ECAL option for the IDEA detector

Thursday 23 May 2024 16:50 (20 minutes)

This work will present the full simulation and reconstruction development of a segmented crystal ECAL option for the IDEA detector, building upon previous 'proto-PFA' work previously simulated in Geant4 by M. Lucchini. The simulation has been implemented with the IDEA dual-readout and tracker packages within the latest key4hep framework, enabling a unified detector description and centralized data schemas for the first time in the era of PFA-oriented detector development. New AI/ML clustering and reconstruction algorithms leveraging the full granularity and longitudinal segmentation of the crystals and timing layer will be presented. The physics case for the detector in the context of probing the Higgs tri-linear self-coupling will also be discussed with a focus on detector-specific characteristics that we advocate as the basis for performance benchmarks for the next generation of colliders, including the FCC-ee.

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