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Dual-readout calorimetry with homogenous crystals

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The Calvision project seeks to develop high resolution calorimetry for the Future Circular Collider (FCC) with state-of-the-art performance for both electromagnetic (EM) and hadronic signatures using the dual-readout technique. We seek to improve the hadronic energy resolution of homogenous scintillating-crystal calorimeters through the measurement and separation of the scintillation and Cherenkov light in hadronic showers. The research program considers materials, sensors, light-collection techniques, readout and signal analysis, accelerated simulation techniques, as well as reconstruction algorithms to improve measurements in data collected at a Higgs factory. This talk will introduce the goals of the research program and review our test beam efforts and proof-of-principle measurements aimed at studying the collection of Cherenkov and scintillation signals in homogenous crystals applicable to an EM layer with dual-readout capability.

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