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R&D progress of high granularity HCAL for CEPC

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Based on the particle-flow paradigm, a novel hadronic calorimeter (HCAL) with high granularity is proposed to address major challenges from precision measurements of jets at future lepton collider experiments, such as the Circular Electron Positron Collider (CEPC). Two technical options have been considered for the HCAL design: one is the digital readout scheme (DHCAL), which uses either glass resistive plate chambers (GRPC) or thick gas electron multiplier detectors (THGEM) as the active medium; the other is the analog readout scheme (AHCAL), which uses either plastic scintillators or glass scintillators as the active medium. Among all these designs, the glass scintillator HCAL design aims for further significant improvements of the hadronic energy resolution as well as the particle-flow performance, especially in the low energy region (typically below 10 GeV for major jet components), with a notable increase of the energy sampling fraction due to its high density. A great number of efforts have been devoted to the HCAL design, including the construction and standalone simulation of HCAL prototypes as well as the full simulation in the CEPC software framework. Physics benchmark potentials with jets in the final state are also being evaluated using a Particle-Flow Algorithm (PFA), named "ArborPFA". In this contribution, the latest R&D progress of high granularity HCAL, especially the glass scintillator scheme, will be introduced

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