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Mechanical design of CEPC HCAL

The HCAL serves as the key detector component through its essential role in jet energy reconstruction within the PFA paradigm. Key features of engineering design include an optimized material composition that achieves the 30% sampling fraction while minimizing the proportion of non-sensitive material. The 16 trapezoidal sectors in the barrel and in the matching endcap disks implement the same layer structures while accommodating distinct geometric constraints. Each 27.2 mm-thick layer combines 9.8 mm steel absorbers with 10.2 mm GS active elements, maintaining uniform 40 mm×40mm×10mm cell granularity throughout. A water cooling system is specifically designed to manage thermal loads mostly from ASIC chips.

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