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## Particle Identification for Dual-readout Calorimeter using Deep Learning

Deep learning methods are being applied to high-energy physics widely. We are investigating deep learning implementations for the dual-readout calorimeter. The dual-readout calorimeter, proposed for future colliders (FCC and CEPC), consists of scintillating and Cerenkov fibers readout together to measure hadronic showers with high energy resolution. Particle and jet identification has always been a challenging problem, especially when relying only on the calorimeter system. Typically, spatial energy distribution in the calorimeter is used to help identify the different types of particles. However, the dual-readout calorimeter captures both scintillating and Cerenkov radiations, which not only helps improve the hadron energy resolution but provides additional pivotal information for particle identification. We present both particle and jet identification performance using image-based deep learning techniques optimized for the dual-readout calorimeter system.

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