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Variational Dropout Sparsification for Particle Identification speed-up.

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Accurate particle identification (PID) is one of the most important aspects of the LHCb experiment. Modern machine learning techniques such as deep neural networks are efficiently applied to this problem and are integrated into the LHCb software. In this research, we discuss novel applications of neural network speed-up techniques to achieve faster PID in LHC upgrade conditions. We show that the best results are obtained using variational dropout sparsification, which provide a prediction speed increase of up to a factor five even when compared to a model with shallow networks.

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