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Correction of Bremsstrahlung emissions for electrons at the LHCb experiment

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When electrons are produced at the LHCb experiment, they usually have a long way to go until they reach the electronic calorimeter (ECAL). In this journey, they will traverse layers and layers of material from the detector, which will cause them to lose energy due to Bremsstrahlung emission in the form of photons. When these photons are emitted before the magnet of the detector, the electrons that produce them will hit a different ECAL region than them due to the magnet bending their trajectory. This poses a big challenge for reconstructing the original energy of electrons, which is crucial for studying a big number of decays generated at the LHCb. Current approaches consist on extrapolating the trajectories of electrons before the magnet in order to find an agreeing region between energy deposits of the electrons and their emitted Bremsstrahlung photons. Nevertheless, this method is not perfect. Therefore, Machine Learning approaches are being considered to improve electron energy reconstruction and very preliminary results are presented in this work.

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