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ML for SUEP Detection

Friday 13 May 2022 12:20 (5 minutes)

We explore a possible avenue for detecting Dark Showers that manifest as Soft Unclustered Energy Patterns (SUEP) in the detector with the use of supervised machine learning techniques and transfer learning. We employ a ResNet model based on Convolutional Neural Networks (CNNs) to classify events. Additionally, a robust, data-driven background estimation technique is embedded into the model architecture through a Distance Correlation (DiSco) term in the loss function of the network; this achieves decorrelation between the classifier output and another physics-motivated discriminant in order to estimate background in the signal region through the ABCD method.

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