

# Use of Machine Learning for gamma/hadron separation with HAWC

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In this poster, we worked on developing a new Gamma/Hadron separation method because it helps to increase the observatory sensitivity. We report the results of two G/H separation models using the machine learning technique (MLT) and compare them with the method used in HAWC, Standard Cut (SC). The MLT models were trained using simulation (eight nuclei

particle and gamma-ray) and they were fed with seven parameters, more variables involved than the SC. These models were tested with simulation (Figure 1), and the MLTs have better results than SC. A robust test is using HAWC real data, in this work we use the candle source for the High energy observatory, the Crab Nebula, that the Boosted Decision Tree reports the best

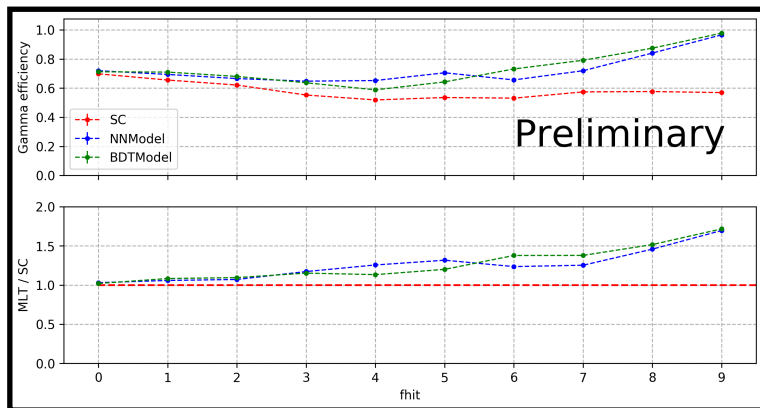


Figure 1: Top panel shows the gamma efficiency for three G/H separation method. On the bottom show the comparison between MLT and SC.

significance (Figure 2).

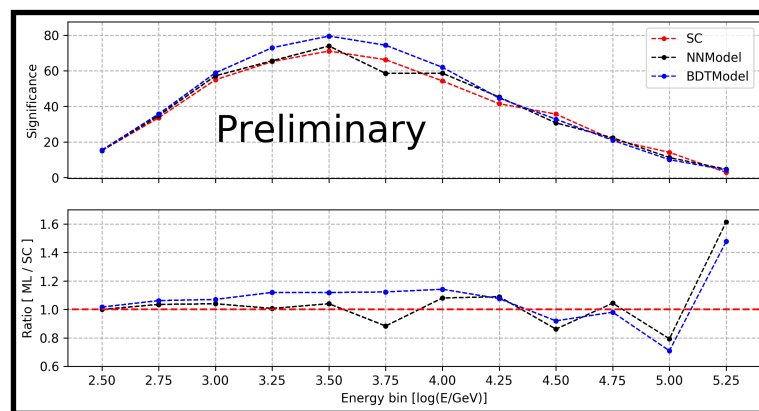


Figure 2: Idem to Figure 5 but here report for each energy bin.