

Horizontal muon track identification with neural networks in HAWC

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Nowadays the implementation of artificial neural networks in high-energy physics has obtained excellent results on improving signal detection. In this work we propose to use neural networks (NNs) for event discrimination in HAWC. This observatory is a water Cherenkov gamma-ray detector that in recent years has implemented algorithms to identify horizontal muon tracks. However, these algorithms are not very efficient. In this work we describe the implementation of two NNs, the first one that focuses on image classification and the second one that is based on object detection. Using these algorithms we obtain an increase in the number of identified tracks. The results of this study could be used in the future to improve the performance of the Earth-skimming technique for the indirect measurement of neutrinos with HAWC.

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Collaboration

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Subcategory

Experimental Methods & Instrumentation

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