

Abstract Submitted
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Application of Clustering ML Algorithms on Neutron Lifetime

Data ELI CARTER, University of Tennessee, Knoxville — The BL2 experiment is an absolute counting experiment that hopes to experimentally find the neutron lifetime using the beam method. In BL2, different classes of events are recorded by the system. These can include multiple protons being trapped at once, neutrons decaying outside the trapping area, and cosmic rays interfering. Previously, mathematical transformations and filters were used to separate out the true and multiple hits from noise. These methods can still leave ambiguity between different types of events and require a user to determine which filter to apply. This paper will explore the application of clustering algorithms to the data, using it to group the different types of events. The KMEANS, DBSCAN, and HDBSCAN algorithms will be applied to the data, analyzed, and the best will be tested on generated pseudo data to find its accuracy.

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