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Pile-up events discrimination based on machine learning in JUNO

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In the large liquid scintillator detector JUNO, β-decays of ^{14}C inevitably deposit energy within the detector, producing scintillation light. These photons can potentially overlap with positron (e^+) signals, forming pile-up events. This pile-up effect can consequently impact the fine reconstruction of the e^+ signal. We have employed three distinct machine learning models –CNN, Transformer, and KamNet –to discriminate between pile-up events and pure e^+ events. This report provides a detailed discussion of this work.

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