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Pile-up event identification and rejection in SNO+: enhancing the signal to noise ratio

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The primary objective of the SNO+ experiment is to detect the neutrinoless double beta decay, a process that, if observed, would revolutionize our understanding of neutrino physics. Achieving this goal requires very low background levels. One significant source of background arises from pile-up events, which occur when two decays happen within the same trigger window and are reconstructed as a single event. To address this challenge, a comprehensive study of various variables was conducted and the impact of applying cuts on these variables was analyzed, determining the best values for each cut. The resulting analysis of the data showed promising progress in effectively separating pile-up events from single events.

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