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P2.76: A comparative study for pile-up correction based on deep neural networks

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The pile-up phenomenon can cause distortion in the recorded data and make it difficult to accurately measure the properties of individual radiation events. This issue can lead to an underestimation of the quantitative analysis, especially in radioisotope identification through gamma-ray spectroscopy. Recently, deep learning-based studies for pile-up correction have been conducted. Those studies established datasets including bi-exponential shapes through experimental or mathematical modeling and proposed deep neural networks that were robust to noise, which resolved spectrum distortion. In this study, we perform a comparative study using three kinds of deep neural networks to select the best model for restoring piled-up pulses. We will optimize deep neural networks and choose the best pile-up correction model based on the restoration results of the spectrum distortion. We expect that this study serves as useful data to select and utilize the best deep neural network for the correction of pile-up caused in high radiation environments.

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