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A Machine Learning Approach to Study the Neutrino Charged-current Interaction on 127I

Tuesday, 14 July 2020 13:40 (25 minutes)

An inclusive measurement of the cross section of the neutrino charged-current interactions on 127I will help study the quenching of gA , the axial-vector coupling constant, which determines the rate of neutrinoless double beta decays. At the Los Alamos Meson Production Facility (LAMPF), an exclusive measurement was made but with a large statistical error. To make an inclusive and more accurate measurement, a 185 kg NaI[Tl] prototype was deployed by the COHERENT collaboration. To reduce the major background, cosmic rays, a machine learning model based on a convolutional neural network (CNN) is being developed. The model, tested with simulations, can remove 78% of the backgrounds while preserving 77% of the cc signals.

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