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Status of the Charged Pion Semi-Inclusive Neutrino Charged-Current Cross Section in NOvA

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The NOvA experiment is a long-baseline neutrino oscillation experiment designed to measure the rates of electron neutrino appearance and muon neutrino disappearance. The NOvA near detector is located at Fermilab, 800 m from the primary target and provides an excellent platform to measure and study neutrino-nucleus interactions. We present the status of the measurement of the double differential cross section with respect to muon kinematics for interactions involving charged pions in the final state, $\nu_{\mu} + N \rightarrow N + \mu \pm \pi \mp X$. We have derived a convolutional neural network-based approach for the identification of neutrino interactions with the specific final state topology. We present event classification efficiency studies using this particle identification and classification methodology, along with systematic uncertainties, background estimates and prospects for the measurement.

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