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Title:	Probing nuclear effects with neutrino-induced charged-current neutral pion production
Authors:	Jena, Satyajit (/jspui/browse?type=author&value=Jena%2C+Satyajit)
Keywords:	nuclear effects neutrino-induced neutral pion production
Issue Date:	2020
Publisher:	American Physical Society
Citation:	Physical Review D, 102(7)
Abstract:	We study neutrino-induced charged-current (CC) $\pi^0$ production on carbon nuclei using events with fully imaged final-state proton- $\pi^0$ systems. Novel use of final-state correlations based on transverse kinematic imbalance enables the first measurements of the struck nucleon's Fermi motion, of the intranuclear momentum transfer (IMT) dynamics, and of the final-state hadronic momentum configuration in neutrino pion production. Event distributions are presented for (i) the momenta of neutrino-struck neutrons below the Fermi surface, (ii) the direction of missing transverse momentum characterizing the strength of IMT, and (iii) proton-pion momentum imbalance with respect to the lepton scattering plane. The observed Fermi motion and IMT strength are compared to the previous MINERvA measurement of neutrino CC quasielastic-like production. The measured shapes and absolute rates of these distributions, as well as the cross section asymmetries, show tensions with predictions from current neutrino generator models.
Description:	Only IISERM authors are available in the record.
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