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Title:	Simultaneous Measurement of Proton and Lepton Kinematics in Quasielasticlike $\nu\mu$ -Hydrocarbon Interactions from 2 to 20 GeV
Authors:	Jena, Satyajit (/jspui/browse?type=author&value=Jena%2C+Satyajit)
Keywords:	Simultaneous Lepton Kinematics Quasielasticlike $\nu\mu$ - Hydrocarbon Interactions
Issue Date:	2022
Publisher:	American Physical Society
Citation:	Physical Review Letters, 129(2), 21803.
Abstract:	Neutrino charged-current quasielastic-like scattering, a reaction category extensively used in neutrino oscillation measurements, probes nuclear effects that govern neutrino-nucleus interactions. This Letter reports the first measurement of the triple-differential cross section for $\nu\mu$ quasielastic-like reactions using the hydrocarbon medium of the MINERvA detector exposed to a wideband beam spanning $2 \leq E_\nu \leq 20$ GeV. The measurement maps the correlations among transverse and longitudinal muon momenta and summed proton kinetic energies, and compares them to predictions from a state-of-art simulation. Discrepancies are observed that likely reflect shortfalls with modeling of pion and nucleon intranuclear scattering and/or spectator nucleon ejection from struck nuclei. The separate determination of leptonic and hadronic variables can inform experimental approaches to neutrino-energy estimation.
Description:	Only IISER Mohali authors are available in the record.
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