Title:	High-Statistics Measurement of Neutrino Quasielasticlike Scattering at 6 GeV on a Hydrocarbon Target
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Abstract:	We measure neutrino charged-current quasielasticlike scattering on hydrocarbon at high statistics using the wideband Neutrinos at the Main Injector beam with neutrino energy peaked at 6 GeV. The double-differential cross section is reported in terms of muon longitudinal ($p_{\parallel}$) and transverse ($p_{\perp}$) momentum. Cross section contours versus lepton momentum components are approximately described by a conventional generator-based simulation, however, discrepancies are observed for transverse momenta above 0.5 GeV / c for longitudinal momentum ranges 3–5 and 9 – 20 GeV / c . The single differential cross section versus momentum transfer squared ($d\sigma / dQ^2_{QE}$) is measured over a four-decade range of Q^2 that extends to 10 GeV ^{2} . The cross section turnover and falloff in the Q^2 range 0.3 – 10 GeV ^{2} is not fully reproduced by generator predictions that rely on dipole form factors. Our measurement probes the axial-vector content of the hadronic current and complements the electromagnetic form factor data obtained using electron-nucleon elastic scattering. These results help oscillation experiments because they probe the importance of various correlations and final-state interaction effects within the nucleus, which have different effects on the visible energy in detectors.
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