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Measuring Nucleon Structure from Neutrino Interactions in MicroBooNE

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The MicroBooNE detector, a liquid argon time projection chamber (LArTPC), is currently running in the Booster Neutrino Beamline at Fermilab. MicroBooNE's high resolution allows a measurement of low-momentum-transfer neutral-current elastic interactions, whose signal is a single short proton track. The probability of these interactions directly depends on the structure of the nucleon and, in particular, the strange quark contribution to the net spin of the proton, Δs . Algorithms are being developed to automatically reconstruct interactions in this growing liquid argon technology. We present our work on the automated selection and identification of short proton tracks in LArTPCs, a crucial step in the measurement of Δs and a number of important neutrino-nucleus cross sections.

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