

Rik Gran – HEP Seminar – October 10, 2023
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Title: Measuring the nucleon axial form factor in deuterium and hydrogen can't be that hard?

Abstract: In a recent paper in Nature, the MINERvA neutrino cross section experiment presented a measurement of the axial form factor of the nucleon using anti-neutrino reactions on protons (hydrogen nuclei). This is the first new nucleon data since the 1980's bubble chamber measurements that used neutrino + neutron (in deuterium) reactions. Phenomenological nucleon form factors are essential information for two customers. They are used in the calculation of the baseline event rates for neutrino + nucleus interactions used in the search of other phenomena, such as neutrino oscillation parameters and CP violation. They can also be calculated using QCD lattice techniques, where calculations may in principle be more precise than the existing measurements. This talk will split between celebrating the 50 year history of the deuterium measurements and describing the new MINERvA measurement, with implications for current and upcoming neutrino experiments such as T2K, NOvA, SBN, and DUNE.