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The Parity Violating Proton Asymmetry from Neutron Capture on Helium-3¹

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While hadronic parity violation was observed almost 60 years ago in compound nuclei with large nuclear enhancements, a systematic characterization of weak interactions among strongly bound systems is still forthcoming. New theoretical frameworks, experimental facilities, and advanced technology have rejuvenated efforts to map out this "complexity frontier" of the Standard Model. A critical measurement in this campaign, the n-³He experiment, was performed at Oak Ridge National Laboratory to obtain a specific combination of the five isospin-dependent couplings which characterize the hadronic weak interaction. We report the parity violating asymmetry from this experiment, the most precise hadronic asymmetry ever measured.

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