

Abstract Submitted  
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**The MOLLER Experiment - Parity-Violating Møller Scattering at Jefferson Lab** KRISHNA KUMAR, Stony Brook University, MOLLER COLLABORATION — The MOLLER experiment at Jefferson Lab will measure the parity-violating asymmetry  $A_{PV}$  in polarized electron-electron (Møller) scattering. An 11 GeV, 90% longitudinally polarized electron beam with a current of  $60 \mu\text{A}$  will be incident on a 1.5 m liquid hydrogen target. A novel two-toroid spectrometer will focus small angle scattered electrons onto an array of 224 quartz Čerenkov detectors 28 m downstream of the target center. The expected  $A_{PV}$  is 33 parts per billion (ppb) with an overall precision goal of 0.7 ppb. This corresponds to  $\sim 0.1\%$  precision on the weak mixing angle, matching the precision of the single best collider determinations and yielding the most precise measurement at low or high energy anticipated over the next decade. This result is sensitive to the interference of the electromagnetic amplitude with new neutral current amplitudes as weak as  $10^{-3}G_F$ . The resulting new physics discovery reach is unmatched by any proposed experiment measuring a flavor-, CP-conserving process over the next decade and yields a unique window to new physics at MeV and multi-TeV scales, complementary to direct searches at high energy colliders. A brief overview of the physics potential and design status of the experiment will be presented.

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