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Polarized electrons for parity violation experiments at Jefferson Lab.¹

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Since 1998, noteworthy electron scattering experiments at the Continuous Electron Beam Accelerator Facility (CEBAF) at Jefferson Lab have employed parity violation as a tool to probe hadronic structure. These experiments, together with experiments performed at other labs, have quantified the strange quark-antiquark pair contribution to the elastic electroweak form factors of the nucleon. More recently, the focus of parity-violation electron scattering experiments at CEBAF has shifted to making precise measurements of the weak mixing angle, θ_w , and the search for physics beyond the Standard Model. Following the successful completion of the CEBAF energy upgrade, a new era of physics experimentation begins. Experiments at traditional “parity violation” Halls A and C can expect to receive polarized beam at 11 GeV. This contribution discusses the characteristics of polarized beams at higher energy, focusing on the helicity-correlated beam properties. The talk also describes planned accelerator improvements that should make it possible to successfully complete proposed parity violation experiments that are more challenging than those completed to date.

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