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(I) Parity violation measurements of the neutron skin in ^{208}Pb and ^{48}Ca

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The PREX-II and CREX experiments at Jefferson Lab have completed measurements of the parity violating elastic electron scattering asymmetry from ^{208}Pb and ^{48}Ca targets. These asymmetries are sensitive to the weak charge radius of the nuclei, and thus to the RMS radius of the neutron distribution. In neutron-rich nuclei such as ^{208}Pb and ^{48}Ca , the neutrons extend to larger radii than the protons, forming the neutron skin. Evaluation of the neutron skin in ^{48}Ca provides an important benchmark for nuclear theory, while that of ^{208}Pb provides meaningful constraints to the density dependence of the symmetry energy in neutron rich nuclear matter, a parameter of the nuclear equation of state. A brief discussion of the experimental techniques, analysis, and results of the experiments will be presented, as well as our understanding of the impact regarding nuclear matter systems, from nuclear structure to neutron stars.

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