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Measuring Neutron Densities with Parity Violating Electron Scattering[1] CHARLES HOROWITZ, SHUFANG BAN, Indiana University, ROBERT MICHAELS, JLAB — Parity violating electron scattering provides a model independent probe of neutron densities because the weak charge of a neutron is much larger than the weak charge of a proton. We estimate required beam time to measure the neutron radius or neutron skin thickness for a variety of nuclei. Lighter nuclei such as 48Ca require significantly less beam time than heavier nuclei such as 208Pb because they can be measured with higher momentum transfers where the parity violating asymmetry is larger. We review the large implications of neutron density measurements for nuclear structure, including three neutron forces, and for astrophysics, including the equation of state of neutron rich matter.

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