

Abstract Submitted  
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**Parity violation measurement of neutron density** ZIDU LIN, CHARLES HOROWITZ, Indiana Univ - Bloomington — Parity-violating electron scattering can measure neutron densities in a model independent fashion because the weak charge of a neutron is much larger than that of a proton. At Jefferson laboratory, the neutron radius of  $^{208}\text{Pb}$  has already been measured by PREX, and a future project CREX aims to measure the neutron radius of  $^{48}\text{Ca}$ . In this work, we propose to measure not only the neutron radius, but the full radial structure of the neutron density distribution in  $^{48}\text{Ca}$ , by measuring the parity violating asymmetry at a number of different momentum transfers and using a Fourier Bessel expansion to fit the neutron density directly. Finally, we estimate the statistical error in the Fourier Bessel coefficients that can be determined for a realistic experimental beam time.

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