Abstract Submitted
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Radiative corrections beyond the ultra relativistic approximation for the PRad experiment[1] MEHDI MEZIANE, Duke University — The clear 7σ discrepancy between measurements of the proton charge radius from muonic hydrogen Lamb shift and those from hydrogen Lamb shift and electron scattering lead to both intense theoretical and experimental efforts to understand and explain this difference. In this regard, an experiment (PRad) based on unpolarized ep elastic scattering cross section measurements, has been proposed and approved at Jefferson Laboratory to extract the proton charge radius up to momentum transfer squared Q^2 as low as 2×10^{-4} $(\mathrm{GeV/c})^2$. Reaching such a small Q^2 region requires reliable knowledge of radiative corrections. Results of a complete calculation of radiative corrections for unpolarized elastic ep and Möller scatterings performed within a covariant formalism beyond the ultra relativistic approximation $m_e^2 << Q^2$ will be discussed and presented. This work is supported by the U. S. Department of Energy under Contract No. DE-FG02-03ER41231 and by the U. S. National Science Foundation under contract number PHY-1229153.

[1]On behalf of the PRad collaboration

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