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Simulation study for PRad experiment CHAO PENG, Department of Physics and Triangle Universities Nuclear Laboratory, Duke University, PRAD COLLABORATION — Proton size puzzle was recently raised by the measurement of muonic hydrogen Lamb shift at Paul Scherrer Institute (PSI). The PSI value greatly increased the precision of the rms charge radius of the proton, but it deviated from the Committee on Data for Science and Technology (CODATA) 2010 recommended value by 7σ . To investigate this discrepancy, the PRad experiment at Jefferson Lab was proposed to extract the proton charge radius with a sub-percent uncertainty by measuring the cross-sections of unpolarized electron-proton elastic scattering in a very low Q^2 region. Such a high precision measurement requires a thorough and accurate knowledge of the possible background sources. A simulation code based on Geant 4 was developed to characterize and quantify the background. Results of the simulation and several methods to suppress the background will be presented. This work is supported by the U.S. Department of Energy under contacts number DE-FG02-03ER41231 and U.S. National Science Foundation under contact number PHY-1229153.

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