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Monte Carlo Simulation and Photon Detector Development for the Radiative Decay Experiment R.L. COOPER, T.E. CHUPP, U. Michigan, K.J. COAKLEY, M.S. DEWEY, T.R. GENTILE, H.P. MUMM, J.S. NICO, A.K. THOMPSON, NIST, B.M. FISHER, I. KREMSKY, F.E. WIETFELDT, Tulane U., E.J. BEISE, K.G. KIRILUK, U. Maryland, J. BYRNE, U. Sussex — We have recently observed the radiative decay mode of the neutron, where an electron and photon are observed in coincidence, followed by a delayed proton. A false signal can be obtained if bremsstrahlung from the electron detector reaches the photon detector. We estimate the contribution from this process to be small. The potential false signal was experimentally addressed by measuring the dependence of the radiative decay process on the available phase space of decay and comparing it to prediction. Phase space was controlled by varying the voltage on an electrostatic mirror to reflect decay protons. We discuss the simulation techniques used to study the systematic effects in the experiment. We also discuss the performance of the photon detector, which operates in a high magnetic field and at cryogenic temperatures. Additionally we present the design of a 12-element scintillation detector that will allow a precision measurement of the radiative decay spectrum.

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