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Calculation and Measurement of Low-Energy Radiative Moller Scattering CHARLES EPSTEIN, Massachusetts Inst of Tech-MIT, DARKLIGHT COLLABORATION — A number of current nuclear physics experiments have come to rely on precise knowledge of electron-electron (Moller) and positron-electron (Bhabha) scattering. Some of these experiments, having lepton beams on targets containing atomic electrons, use these purely-QED processes as normalization. In other scenarios, with electron beams at low energy and very high intensity, Moller scattering and radiative Moller scattering have such enormous cross-sections that the backgrounds they produce must be understood. In this low-energy regime, the electron mass is also not negligible in the calculation of the cross section. This is important, for example, in the DarkLight experiment (100 MeV). As a result, we have developed a new event generator for the radiative Moller and Bhabha processes, with new calculations that keep all terms of the electron mass. The MIT High Voltage Research Laboratory provides us a unique opportunity to study this process experimentally and compare it with our work, at a low beam energy of 2.5 MeV where the effects of the electron mass are significant. We are preparing a dedicated apparatus consisting of a magnetic spectrometer in order to directly measure this process. An overview of the calculation and the status of the experiment will be presented.

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