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A Calculation and Measurement of Radiative Moller Scattering at 100 MeV with DarkLight CHARLES EPSTEIN, Massachusetts Inst of Tech-MIT, DARKLIGHT COLLABORATION — A number of current experiments rely on precise knowledge of electron-electron (Moller) and positron-electron (Bhabha) scattering. Some of these experiments, having lepton beams on atomic targets, use these QED processes as normalization. In other cases such as DarkLight (at the Jefferson Lab ERL), with electron beams at relatively low energy (100 MeV) and very high intensity (1 Megawatt), Moller scattering and radiative Moller scattering have such enormous cross-sections that they produce copious amounts of noise that must be understood. In this low-energy regime, the electron mass is also not negligible. As a result, we have developed a new Monte Carlo event generator for the radiative Moller and Bhabha processes, extending existing soft-photon radiative corrections with new, exact single-photon bremsstrahlung calculations, and keeping all terms of the electron mass. DarkLight provides us a unique opportunity to study this process experimentally and compare it with our work. As a result, we are preparing a dedicated apparatus consisting of two magnetic spectrometers as part of the first phase of DarkLight in order to directly measure this process. An overview of the calculation and the status of the experiments construction will be presented.

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