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Modeling of the pressurized xenon gamma ray scintillation detector ROMNEY MEEK[1], ALEXANDER BARZILOV, IVAN NOVIKOV, Western Kentucky University, Dept. of Physics and Astronomy — We are developing a high pressure xenon detector for photon measurements. Xenon produces electroluminescence (EL) scintillation emission that we use as the primary signal in our strategy to acquire information. The detector consists of a high pressure chamber, a thin radiation input window with the supporting grid of collimator ribs and electrode grids to create the electric field, and a photo sensor – the large area silicon avalanche photodiode. The electrode grids are made of thin wire. The modeling of the electric field is a crucial step in developing a working prototype. It has been previously shown that the uniform electric field divided by the number density of xenon gas needs to be above approximately 3 Td to give enough energy to ionize the xenon atoms, but less than 16 Td to prevent electron avalanches from occurring. The electric field was modeled using Comsol Multiphysics. This presentation discusses the results of electric field modeling for the detector (absorption, drift, and EL regions).

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