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**Modeling electric fields inside the LUX detector in 3D using $^{83m}$Kr calibration data** LUCIE TVRZNIKOVA, Yale University, LUX COLLABORATION — The Large Underground Xenon (LUX) experiment is a 350 kg two-phase liquid/gas xenon time projection chamber designed for the direct detection of weakly interacting massive particles, a leading dark matter candidate. LUX operates on the 4850 ft level of the Sanford Underground Research Facility in Lead, SD. Weekly calibrations using a homogeneous injection of a monoenergetic $^{83m}$Kr source enable us to monitor xenon within the active region. For this project, a 3D model of the electric fields inside the LUX detector was created using COMSOL Multiphysics software. A simulation of electrons drifting in the detector then produces a set of computational predictions. These are then reconciled with the $^{83m}$Kr data to confirm the accuracy of the field model. The result of this work is a more accurate understanding of the electric field inside the active region. This model, in conjuction with these methods, may now be used to study other phenomena such as possible surface charge buildup in detector materials.

Lucie Tvrznikova
Yale University

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