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Characterizing electroluminescence region of the NEXT high pressure gaseous xenon TPC with Kr gas

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The NEXT experiment is a neutrino physics program searching for neutrinoless double beta decay using high pressure gaseous xenon time projection chambers (HPGXeTPC). The HPGXeTPC technology offers several advantages, including excellent energy resolution, topological event discrimination, and calibration with gaseous, radioactive krypton. We will discuss the power of this calibration technique for characterizing the electroluminescence region, where S2 signals are produced. We discuss the impact of variation in the voltage on light production and event detection, as well as demonstrating capability to extract structural information about the EL gap from Kr calibration data. We will furthermore show an improved understanding of diffusion related effects in our detector.

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