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Sensitivity of the LUX detector to the possible neutrinoless double beta decay of ^{134}Xe EVAN PEASE, Yale University, THE LUX COLLABORATION COLLABORATION — The Large Underground Xenon (LUX) detector is a 370-kg liquid xenon (LXe) time-projection chamber designed primarily for the direct detection of weakly-interacting massive particles (WIMPs), a leading dark matter candidate. LUX operates on the 4850-foot level of the Sanford Underground Research Facility in Lead, SD. The unenriched xenon of LUX contains the natural 10.4% abundance of the isotope ^{134}Xe, a candidate for the lepton-number-violating process of neutrinoless double beta ($0\nu\beta\beta$) decay. If observed, this process would confirm the existence of massive Majorana neutrinos and would be a possible path to the measurement of neutrino mass and other studies of new weak-interaction physics. Given its xenon mass and the length of exposure for the LUX detector, there is an opportunity to improve upon the $T_{1/2} > 5.8 \times 10^{22}$ yr sensitivity of the 6.5-kg DAMA experiment (enriched to 17.1% ^{134}Xe) from 2002 (Bernabei, et al., Phys. Lett. B 527, 182-186, 2002.). Building upon previous LUX measurements of the energy resolution and signal yields up to 662 keV, this talk will go over the response of the LUX detector at 826 keV, the ^{134}Xe Q-value, and the current status of the LUX ^{134}Xe $0\nu\beta\beta$ analysis.

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