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Measurement of electron longitudinal diffusion coefficient in liquid argon YICHEN LI, WEI TANG, XIN QIAN, Brookhaven National Laboratory — The electron longitudinal diffusion coefficients in Liquid Argon (LAr) are measured for a range of electric fields from 0.05 to 2.0 kV/cm up to a maximum drift distance of 120 mm using the two experimental setups at BNL. The measurement principle, apparatus, and data analysis are described. Our result represents the world's best measurement of electron longitudinal coefficients in this range. The measured longitudinal diffusion results are directly applicable to the existing experiments such as MicroBooNE and are essential for the future LAr based experiment detector design such as SBN and DUNE. We also report the performance of the gas purification system, which is important for the design of the purification system of future large LArTPCs.

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