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The uncertainty analysis on energy scale due to the variation of W value for liquid xenon dark matter detector[1] LU WANG, DONGMING MEI, Univ of South Dakota, CUBED COLLABORATION — The average energy expended per electron-ion pair, W value, is critical in understanding a liquid xenon detector energy response to low energy recoils. The reduction of scintillation and ionization yield for electronic recoils and nuclear recoils are explained using the scintillation quenching mechanism due to the variation of the average energy expended per electron hole pair, W value, which includes the energy lost to scintillation and phonon generation. We show the theoretical calculation of scintillation efficiency with W value in comparison with experimental data. The impact of variation of W value on the analysis of energy scale is discussed in detail. We conclude that the W value determined with experimental data depends on recoil energy and particle type.

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