Simulation of charge readout with segmented charge tiles in nEXO ZEPENG LI, Yale University, NEXO COLLABORATION — nEXO is a proposed experiment to search for $0\nu\beta\beta$ decays of ^{136}Xe in a single phase liquid xenon time projection chamber (TPC) with 5 tonnes of liquid xenon. The nEXO TPC is designed to use segmented charge tiles as the anode to read out ionization electrons. A dedicated simulation package is developed to study the performance of this anode design. A multivariate method and a deep neural network are developed to distinguish $0\nu\beta\beta$ decays and background events arising from radioactivity in the detector materials using the simulated charge signals. The nEXO TPC with charge tiles forming the anode shows promising capability to distinguish signal and backgrounds in the study. A half-life sensitivity for $0\nu\beta\beta$ decays is estimated with the discriminators, which suggests the potential for $\sim$20 (32)% employing the multivariate (deep neural network) methods considered here, relative to the sensitivity estimated in the nEXO pre-conceptual design report.

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