

# Photo-detector system with large area SiPM in nEXO

*Wednesday, 28 November 2018 14:30 (20 minutes)*

The Enriched Xenon Observatory (EXO) is aiming to search for  $0\nu\beta\beta$  decays of  $^{136}\text{Xe}$  by using liquid xenon TPC detector. nEXO is the second phase of EXO with 5 tons of enriched liquid xenon TPC with ultra-low background. In order to meet the requirements of 1% energy resolution (at Q of  $^{136}\text{Xe}$ , 2.458 MeV) and low background,  $\sim 4\text{ m}^2$  of SiPM arrays will be used to collect 175 nm scintillation light from xenon. The overall photon detection efficiency in TPC, consisting of photon transport efficiency and photon detection efficiency of SiPMs, is one of main factors that limits the energy resolution. In the past few years, lots of efforts have been made to characterize the performance of SiPMs and develop the photo-detector system. In this talk, we will discuss the following topics: (a) requirements of photo-detector system in nEXO; (b) characterization of SiPMs manufactured by Fondazione Bruno Kessler (FBK) and Hamamatsu Photonics; (c) measurement of SiPM VUV reflectivity in vacuum and liquid xenon; (d) development of silicon interposer used to support and connect SiPM and readout electronics; (e) some of other challenging issues.

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