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SiPM development for nEXO

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Silicon photo-multipliers (SiPMs) have been chosen for detecting liquid Xenon scintillation light in the nEXO experiment being designed to search for neutrinoless double beta decay. SiPMs from FBK and Hamamatsu more or less fulfill nEXO's specifications achieving more than 15% photo-detection efficiency (PDE) at 175nm. However, the interplay between PDE, reflectivity (as high as 55% at 175nm), gain, correlated avalanches (after-pulsing cross-talk both internal and external) is being studied in details using a wide range of setups (mini-nEXO, Light only liquid Xenon, reflectivity measurement setup in vacuum and liquid Xenon,...). In addition the nEXO collaboration continues to drive the development of SiPMs with towards PDE>25% at 175nm and is exploring using 3D integrated digital SiPMs, that would minimize power dissipation in liquid Xenon over conventional electronics. In this talk, we will describe the SiPM development effort for achieving unprecedented sensitivity to neutrinoless double beta decay in nEXO.

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