Contribution ID: **58** Type: **Lightning talk**

Cherenkov Light Separation in LXe for Improved Background Rejection

Thursday, 26 October 2023 16:00 (7 minutes)

With the development of fast sub-nanosecond photosensors and the increasing size of xenon-based detectors for neutrinoless double beta decay ($0\nu\beta\beta$) the time-of-flight difference between scintillation and Cherenkov light can be exploited for further background mitigation. This is especially crucial for the rejection of elastic scattering of solar neutrinos, which presents a major and irreducible background for a kilotonne-scale experiment. In this talk I will present some considerations for the light detection performance of a future kt-scale xenon detector searching for $0\nu\beta\beta$ based on fast GPU-based light simulations and the projected background rejection capabilities and resulting gain in sensitivity to $0\nu\beta\beta$ using the Cherenkov light separation technique.

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Session Classification: Session 1/1