

Abstract Submitted  
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**3-dimensionally integrated photo-detector for neutrino physics and beyond** FABRICE RETIERE, TRIUMF — Silicon photo-multipliers (SiPMs) are a promising solution for the detection of scintillation light of liquid Xenon and Argon in applications requiring minimum radioactivity content such as neutrinoless double beta decay. The nEXO experiment in particular is planning to use SiPM planes covering  $5 \text{ m}^2$  for the detection of the light emitted within 5 tons of liquid Xenon. The 3-dimensionally digital integrated SiPMs (3DdSiPMs) is an emerging technology that if successful would challenge the analog SiPM technology. Indeed, by combining separate photo-detector and electronics chips within a single package, 3DdSiPM achieve excellent performances for photon counting and time stamping, while dissipating minimum power. Being mostly based on high purity silicon chips, 3DdSiPMs are also expected to achieve excellent radiopurity. The development of 3DdSiPMs for applications in liquid Xenon is expected to progress rapidly by altering the design of the first successful chip assembly developed for medical imaging, focusing on minimizing power dissipation and large area ( $> \text{cm}^2$ ) scaling. In this talk we will describe the 3DdSiPM concept a solution for "light to bit conversion" within a single package and show how it may revolutionize light detection in noble-gas liquids and beyond.

Fabrice Retiere  
TRIUMF

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