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Thin A-Se films for novel scintillation light detectors

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VUV scintillation light detection in noble liquids is a hot topic in detector R&D given its wide range of applicability: from next generation of acceleration neutrino detectors to dark matters, to neutrino less double beta decay. In this talk, we present advancements in light detection R&D via coatings of thin semiconductive VUV sensitive films. With the proper choice of photoconductive material such a device could have a broad frequency response and thus all the detection of the full spectrum of light produced in Noble Element TPCs. The starting semiconductor of choice is amorphous selenium (A-Se), which is already used in imaging for medical applications in warm and in the X-ray spectrum. Our first challenge is the use of ASe coatings on mm wide pixels in cold subject to VUV light. An additional benefit of this research is to be the stepping stone towards the development of multiple modality pixels, i.e. pixel capable of reading both VUV light and fC charge simultaneously, applicable in future LArTPCs.

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