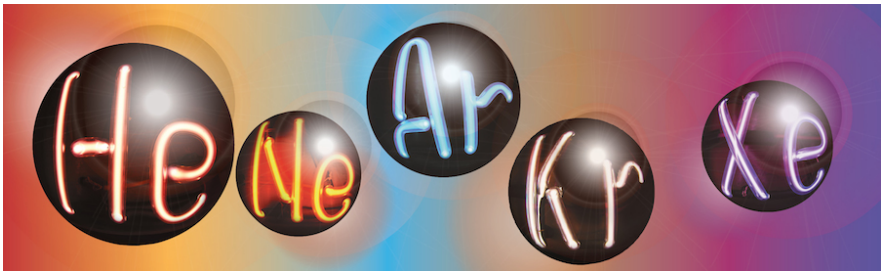

Contribution ID: **21** Type: **Presentation**

Rugged and radiopure amplification structures for large-area xenon chambers read out through electroluminescence

Wednesday, 21 September 2022 14:25 (15 minutes)

Large scintillation gaps are desirable for electroluminescence chambers with ultimate energy resolution and single-electron counting characteristics, whereas large-area amplification structures are needed for next-generation ton-scale experiments. We present systematic studies of a custom designed structure (Field-Assisted Transparent Gas Electroluminescence Multiplier, or FAT-GEM), consisting of a hole matrix on an acrylic plate. The structures, produced at CERN and ASTROCENT workshops following different fabrication techniques, are radiopure and mechanically robust, allow manufacturing on large areas and are amenable to tiling in a seamless manner (i.e., no dead-regions). In this presentation we will present a systematic characterization with an x-ray source and comparison with simulations for different FAT-GEM architectures.
As a self-supported structure allows for optimization of the point-spread function, increasing the light collection efficiency and implementing wavelength-shifting capabilities, the potential of this technological solution is very broad. We will present first results of such 'active'designs and prospects, including the use of PEN, TPB and ESR reflectors incorporated into the structure.

Primary authors: LEARDINI, Sara (University of Santiago de Compostela); AZEVEDO, Carlos; FERNÁNDEZ POSADA, David José; GONZALEZ DIAZ , Diego; KUŹNIAK, Marcin (AstroCeNT / CAMK PAN); AMEDO, Pablo; SWOROBOWICZ, Tadeusz; SAA-HERNÁNDEZ, Ángela

Presenter: LEARDINI, Sara (University of Santiago de Compostela)

Session Classification: Light and charge readout

Track Classification: Light/charge readout (PMT, SiPM, WLS, electronics etc.)