Contribution ID: **28** Type: **"Rapid fire" talk**

Back-side Illuminated SiPM for VUV/NUV light detection at Fondazione Bruno Kessler: first results

Tuesday, 18 March 2025 14:55 (5 minutes)

Advancements in 3D interconnecting technologies have significantly contributed to the emergence of a new generation of Silicon Photomultipliers (SiPM), which we can refer to as hybrid devices. These devices integrate the functionalities of digital SiPMs with the exceptional performance characteristics of specialized custom technologies. In recent years, the Fondazione Bruno Kessler (FBK) has been working on the technological development of Backside Illuminated (BSI) SiPMs for Vacuum Ultraviolet (VUV) and Near Ultraviolet (NUV) light detection, particularly in applications in particle physics experiments, such as detection of scintillation from liquefied noble gases.

For this wavelength range, a BSI detection technology faces critical challenges due to silicon's low photon interaction depth (less than 100 nm for λ = 400 nm). This necessitates the complete removal of the substrate, a process that has already been successfully demonstrated at FBK and the creation of a thin active "entrance window". Additionally, for VUV-sensitive devices, the glass carrier wafer must be removed from the entrance window, as it typically absorbs light for wavelengths shorter than 350 nm. We will present the latest progress in the microfabrication technology of BSI-SiPMs and the results from the first batch, produced in the framework of the INFN IBIS project.

Primary author: PARELLADA MONREAL, Laura (Fondazione Bruno Kessler)

Co-authors: GOLA, Alberto Giacomo (Istituto Nazionale di Fisica Nucleare); Dr FICORELLA, Andrea (Fondazione Bruno Kessler); Dr CATTO, Giacomo (Fondazione Bruno Kessler); PATERNOSTER, Giovanni (Fondazione Bruno Kessler); RUZZARIN, Maria (FBK); ZORZI, Nicola (Istituto Nazionale di Fisica Nucleare); Dr KACHRU, Priyanka (Fondazione Bruno Kessler); Dr MERZI, Stefano (Fondazione Bruno Kessler); ACERBI, fabio (FBK)

Presenter: PARELLADA MONREAL, Laura (Fondazione Bruno Kessler)

Session Classification: Liquid Detectors

Track Classification: Liquid Detectors