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Production of Resistive Micromegas: Technology Transfer to Industry

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In recent years, Resistive Micromegas detectors have undergone an intense R&D phase to ensure their technological advancements for safe operation under diverse experimental conditions. Both low and high-rate versions have matured to be employed in upgrades of current detectors, large apparatuses at future colliders, and applications beyond high-energy physics.

Thus far, the advancement and development of Micromegas have been primarily conducted at CERN. The state-of-the-art technology includes resistive structures based on DLC (Diamond-Like Carbon). A collective effort is underway to perfect the technology of sputtering and to produce high-quality, cost-effective DLC foils, utilising the new magnetron sputtering machine available at CERN.

To meet the demands of massive production for large and challenging projects, significant involvement from industrial partners is essential. Consequently, an extensive process of technology transfer to industry has been underway for several years with ELTOS S.p.A, a well-known company already involved in the large-scale production of detector elements for CERN experiments.

This presentation will review the steps involved in the production of resistive Micromegas, the advancements in DLC production, and will primarily focus on the industrialization process at ELTOS. Notably, the production at ELTOS includes bulk processing using photo-imageable films to encapsulate the mesh on the anode, which is a non-standard PCB process. Finally, the critical aspects that still need to be resolved will be highlighted.

Author: IODICE, Mauro (INFN Roma Tre)

Co-authors: SEKHNIADZE, Givi (INFN Napoli); CAMERLINGO, Maria Teresa (INFN Bari); ALVIGGI, Mariagrazia (INFN Napoli); PIETRA, Massimo Della (INFN Napoli;Universita' di Napoli Federico II); BIGLIETTI, Michela (INFN Roma Tre); IENGO, Paolo (INFN Napoli); NARDO, Roberto Di (INFN Roma Tre;Universita' Roma Tre)

Presenter: IODICE, Mauro (INFN Roma Tre)

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