Performance and long-term ageing studies on Eco-Friendly Resistive Plate Chamber detectors

Resistive Plate Chambers detectors are extensively used in several domains of Physics. In High Energy Physics, they are typically operated in avalanche mode with a high-performance gas mixture based on Tetrafluoroethane (C2H2F4), a fluorinated high Global Warming Potential greenhouse gas.

The RPC EcoGas@GIF++ Collaboration has pursued an intensive R&D activity to search for new gas mixtures with low environmental impact, fulfilling the performance expected for the LHC operations and for future and different applications.

In this talk, results obtained with new eco-friendly gas mixtures based on Tetrafluoropropene and carbon dioxide even under high-irradiation conditions will be presented. Long term ageing tests carried out at the CERN Gamma Irradiation Facility will be discussed together with their possible limits and future perspectives.

Workshop topics

Detector systems

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