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

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In High Energy Physics Resistive Plate Chamber (RPC) detectors are typically operated in avalanche mode, making use of a high-performance gas mixture which main component, Tetrafluoroethane (C2H2F4), is classified as a fluorinated high Global Warming Potential greenhouse gas.

The RPC EcoGas@GIF++ Collaboration is pursuing an intensive R&D on new gas mixtures for RPC detectors to explore environmentally friendly alternatives complying with recent European regulations. During the last few years, the performance of RPCs characterized by different layouts and read-out electronics have been studied with Tetrafluoropropene (C3H2F4)-CO2 based gas mixtures at the CERN Gamma Irradiation Facility. A long-term ageing test campaign was launched in 2022 and is still on-going. In 2023 and 2024 all detector systems underwent evaluation by means of dedicated beam tests.

Preliminary results on these studies will be presented in this talk together with their future perspectives.

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