

# New RPC Gas Mixtures for Sustainable Operation in the CMS Experiment

*Friday, 31 May 2024 15:40 (1 minute)*

The current operation of the Resistive Plate Chamber (RPC) system within the CMS experiment involves approximately 95% tetrafluoroethane (C<sub>2</sub>H<sub>2</sub>F<sub>4</sub>, TFE). However, in response to climate change concerns, the European Union has instituted a ban on TFE owing to its elevated Global Warming Potential (GWP), resulting in an associated increase in market prices. In this framework, shared endeavors within the RPC EcoGas@GIF++ Collaboration, have been dedicated to investigating novel ecological gas mixtures based on tetrafluoropropene (C<sub>3</sub>H<sub>2</sub>F<sub>4</sub>, HFO-1234ze) to ensure the sustainable functionality of RPCs. This presentation will delve into the performance outcomes derived from improved RPC gas gaps operating on HFO/CO<sub>2</sub>-based mixtures as ecologically viable alternatives, particularly in anticipation of the High Luminosity LHC phase. Additionally, the utilization of TFE/CO<sub>2</sub> mixtures will be explored as a pragmatic strategy to swiftly alleviate gas-related operational costs.

## Collaboration

CMS Collaboration

## Role of Submitter

The presenter will be selected later by the Collaboration

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**Session Classification:** Gas Detectors - Poster session

**Track Classification:** T6 - Gas Detectors