

Contribution ID : **69** Type : **Poster**

Data Analysis for Time Resolution Studies of RPCs with Eco-Friendly HFO/CO_2-based Gas Mixtures

Thursday, 22 October 2026 17:00 (2:00)

Abstract

Reducing the environmental impact of Resistive Plate Chambers (RPCs) requires alternative gas mixtures that preserve detector performance. This study investigates the timing response of double-gap RPC prototypes equipped with CMS Upgrade iRPC gaps, comparing the standard CMS gas mixture with the reduced-global-warming-potential HFO/CO_2-based mixture ECO2. Test-beam data collected at CERN's Gamma Irradiation Facility (GIF++) were analyzed under different gamma-irradiation conditions. The analysis combines cluster reconstruction, automatic spatial matching, Gaussian fits to inter-detector time differences, and quality and stability selection. Assuming independent and comparable detector contributions, the single-detector time resolution is estimated from the fitted Gaussian width and evaluated near the respective working points. This work complements previous ECO2 characterization studies by providing a dedicated framework for investigating RPC timing performance with sustainable gas alternatives.

Primary author(s) : Ms. AHUATZI CORONA, Mirian (Monterrey Institute of Technology and Higher Education)

Co-author(s) : Dr. RAMOS LÓPEZ, Dayron (Università e INFN, Bari, Italy); Dr. SHAH, Mehar Ali (CERN)

Presenter(s) : Ms. AHUATZI CORONA, Mirian (Monterrey Institute of Technology and Higher Education)

Session Classification : Poster Session