RPC ECOgas@GIF++

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Setup description and motivation:
The RPC ECOgas@GIF++ collaboration setup consists of a set of Resistive Plate Chambers (RPCs) detectors employed by the ALICE, ATLAS, CMS, ShiP/LHCb experiments and CERN EP/DT group. The detectors are produced by different manufacturers and include RPCs of different shape, sizes and gap thickness.

RPCs at LHC are operated in avalanche mode using a high Global Warming Potential gas mixture, composed by ~95% C2H2F4, ~4% iC4H10, ~1% SF6. The goal of the ECOGAS collaboration is to study the performance of eco-friendly gas mixtures in the presence of background radiation. The detectors in the setup are operated in open mode with HFO-based, eco-friendly gas mixtures. The system is governed by an online DCS tool, which is used both to control the CAEN power supply and also the TDCs used for the data acquisiton. An online monitoring tool is also used to store all the relevant detector and ambient parameters during the data taking.

We estimate a total gas consumption of around 4 kL of CO_2, 2.6 kL of HFO, 1.5 kL of R134a, 90 L of SF_6 and 370 L of isobutane

The motivation for the use of beam time is to test the performance of the detectors operated with these new gas mixtures. Furthermore, we are also carrying out an extensive aging campaign and, forthis reason, will also use the beam time to carry out a comparison of all the key parameters of detector operation (efficiency, cluster size etc) with the ones obtained in 2022/2023 beam periods

Preferred muon instensity per spill: 10k per spill in external scintillators (but we don’t have a strong request on this number)
Beam request: 3 x 2 weeks
Preferred weeks: 20-21 and 36-37 (preferred and third one in the middle of those)