Contribution ID: 296

Strategies for reducing the environmental impact of gaseous detector operation at the CERN LHC experiments

Tuesday 16 February 2016 11:45 (20 minutes)

A wide range of gas mixtures is used for the operation of different gaseous detectors at LHC. Nowadays some of these gases, as C2H2F4, CF4 and SF6, are indicated as greenhouse gases (GHG) and dominate the overall GHG emission at LHC. The release of GHG is an important subject for the design of future particle detectors as well as for the operation of the current experiments.

The different strategies adopted at CERN for reducing the GHG emissions from gaseous detectors at LHC are presented.

The standard approach is the recirculation of the gas mixture by the use of complex gas systems made of several functional modules. Besides their complexity, the stability of the system as well as the accumulation of impurities, need to be attentively evaluated for the good operation and safety of the detectors.

A second approach is based on the recuperation of the used gas mixture and the separation of its gas components for re-use. As state-of-the-art example, the CF4 recuperation plant based on warm separation developed for the CMS Cathode Strip Chamber system will be reviewed.

As a long-term perspective, the use of less invasive gases is also being investigated. An overview of environmental friendly gas possibilities will be discussed.

Authors: MANDELLI, Beatrice (CERN); CAPEANS GARRIDO, Mar (CERN); GUIDA, Roberto (CERN)

Presenter: MANDELLI, Beatrice (CERN)

Session Classification: Plenary 3

Track Classification: Gaseous Detectors