

## Long-term Operation of the Multi-Wire-Proportional-Chambers

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The muon detector of LHCb, which comprises 1368 multi-wire-proportional-chambers (MWPC) for a total area of 435 m<sup>2</sup>, is the largest instrument of its kind exposed to such a high-radiation environment. In nine years of operation, from 2010 until 2018, we did not observe appreciable signs of ageing of the detector in terms of reduced performance. However, during such a long period, many chamber gas gaps suffered from HV trips. Most of the trips were due to Malter-like effects, characterised by the appearance of local self-sustained high currents, presumably originating from impurities induced during chamber production. Very effective, though long, recovery procedures were implemented with a HV training of the gaps in situ while taking data. The training allowed most of the affected chambers to be returned to their full functionality and the muon detector efficiency to be kept close to 100%. The possibility of making the recovery faster and even more effective by adding a small percentage of oxygen in the gas mixture has been studied and successfully tested.

**Authors:** SCIASCIA, Barbara (INFN (Frascati)); SCHMIDT, Burkhard (CERN); CHULIKOV, Vladimir (NRC Kurchatov Institute PNPI (RU)); BALDINI, Wander (Universita e INFN, Ferrara (IT))

**Presenter:** CHULIKOV, Vladimir (NRC Kurchatov Institute PNPI (RU))

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