

LHC vacuum system: 2012 review and 2014 outlook

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Abstract

During the last two years of LHC operation, electron and photon-stimulated beam-induced gas desorption were constantly observed. The routine operation combined with several dedicated periods focused on beam pipe conditioning/scrubbing, allowed decreasing those sources of gas. The pressure evolution due to electron cloud and photon stimulated desorption is analysed and discussed.

The so called "pressure spikes" detected during these year are treated and correlated with the cryogenic temperature, beam pipe structure and non-conformities.

The pressure threshold policy adopted since the beginning of the LHC running is examined in terms of beam vacuum performances and beam dumps.

A review of the major localised interventions performed on the beam pipe during technical stops and shutdowns is given, with a list of the good results, the issues met and the possible improvements.

Finally, the vacuum expectations during LHC nominal runs, that will follow the LHC consolidations during the Long Shutdown 1, are discussed.