Dynamic pressure in the LHC
Detection of ions induced by ionization of residual gas by both the proton beam and the electrons in the LHC : implications for the FCC project*

S. BILGEN†, C. BRUNI1, B. MERCIER1, G. SATTONNAY1, V. BAGLIN2.
1LAL, Paris-Sud University, CNRS/IN2P3, Orsay, France.
2CERN, The European Organization for Nuclear Research, Geneva, Switzerland.
†bilgen@lal.in2p3.fr * Work supported by FCC project

Introduction
For the LHC study, understanding the beam interactions with the vacuum chamber is fundamental to provide solutions to mitigate the pressure rises induced by electronic, photonic and ionic molecular desorption [1].

In-situ measurements were carried out on the LHC Vacuum Pilot Sector [2] during the LHC RUN II, to monitor the dynamic pressure, and to collect the electrical signals due to the electron cloud and to the ions interacting with the vacuum chamber walls.

Development of DYVACs code was performed at the Linear Accelerator Laboratory (LAL) in France, in order to estimate gas density profiles taking into account electron cloud build-up [3] and ionization of residual gas leading to electron- and the ion- induced desorption.

DYVACs

Ions or not ions?

Calculations vs experimental measurements

Conclusion

Acknowledgments

References