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Electron stimulated desorption yield of technical materials used in the LHC vacuum system

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In 2017, LHC overcame the target for integrated luminosity achieving the goal of 125 fb⁻¹ since the start of its operation. All along this period LHC vacuum system successfully faced the challenge of the pressure instabilities generated by electron clouds. In this framework Electron Stimulated Desorption (ESD) studies revealed to be fundamental for dynamic pressure prediction and limitation.

This article presents a summary of laboratory investigations performed in support of beam vacuum operation team on electron stimulated desorption for technical materials. The phenomenon of loss of conditioning was deeply analysed in different operation conditions: static vacuum effect was considered together with the effect of different venting techniques according to standard and non-standard vacuum operation procedures. In case of NEG-coated sample, the effects of partial activation and different saturation effects were analysed, too.

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