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Vacuum upgrade

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The last two years of LHC operation have highlighted concerns on the levels of the dynamic vacuum in the long straight sections (LSS) in presence of high intensity beams. The analysis of the existing data has shown relationship between pressures spikes and beam screen temperature oscillations or micro-sparking in the RF fingers of the bellows on one side and coincidence of pressure bumps with stimulated desorption by electron cloud, beam losses and/or thermal out gassing stimulated by HOM losses.

The electron cloud mitigation solutions will be adapted to the different configurations: cold/warm transitions, non-coated surfaces in direct view of beams, photoelectrons, etc. All scenarios will be presented together with their efficiencies. Additional pumping and reengineering of components will reduce the sensitivity of the vacuum system to beam losses or HOM inducing out gassing. The expected margin at nominal intensity and energy resulting from these consolidations will be summarized.

Finally, the challenges of the Experimental areas will be addressed, more specifically the status of the new Beryllium pipes (ATLAS and CMS) which are in the critical path and the consolidation of vacuum instrumentation, pumping and electron cloud mitigation. The risk corresponding to the proposed consolidations will be shown and the margins with respect to the schedule analyzed.

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