

## **Electron Cloud and Heat Loads**

*G. Iadarola*

During Run 2, the 25 ns bunch spacing was routinely used for proton physics operation at the LHC. With this bunch spacing, electron cloud effects are significantly more severe than with the 50 ns spacing, which had been used for luminosity production in Run 1.

Beam induced scrubbing allowed to mitigate the electron cloud formation enough to allow an effective exploitation of 25 ns beams for physics operation. Nevertheless, even after years of conditioning of the beam chambers, e-cloud effects remain very visible, affecting beam stability and beam quality preservation, and generating a significant heat load on the beam screens of the superconducting magnets.

Surprisingly, the eight LHC arcs show very different behaviors, with the heat load being much higher for some of them (S12, S23 and S81) compared to the others. In these sectors, the heat loads are very close to the nominal cooling capacity delivered by the corresponding cryoplant, which is a concern in view of the planned upgrade program. A dedicated interdepartmental Task Force has been setup to investigate this issue.

This contribution summarizes the relevant observations and studies conducted during Run 2, the interventions planned for LS2 and briefly discusses prospects for Run 3.