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## Optimizing Pb beam losses at the LHCb for maximum luminosity

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In addition to the physics program with proton beams, the Large Hadron Collider (LHC) also provides collisions of fully-stripped Pb beams for about one month per year. When colliding Pb-Pb nuclei, electromagnetic interactions are the dominating processes because of the intense Coulomb field produced by the ions. These 'ultra-peripheral' interactions give rise to special losses in the machine that can impose limits on the luminosity. Among them, the bound-free pair production (BFPP) causes a localized power deposition downstream of each collision point, which could induce superconducting magnet quenches if not well controlled. These losses were studied and successfully mitigated for most LHC experiments, however the recent request by LHCb to increase the Pb-Pb luminosity requires a revision of BFPP collisional loss limitations. In this paper, the simulation of BFPP losses from Pb-Pb collisions around LHCb is presented. The loss patterns are discussed for different beam parameters. Finally, a mitigation strategy by means of an orbit bump is studied.

### Funding Agency

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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