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## Electron cloud build-up studies for FCC-ee

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The Future Circular Collider (FCC) study is developing designs for a new research infrastructure to host the next generation of higher performance particle colliders to extend the research currently being conducted at CERN. In particular, FCC-ee is an electron-positron collider, which is the first stage towards a 100 TeV proton-proton collider FCC-hh.

FCC-ee may be affected by electron cloud (e-cloud) and the strongest effects are foreseen for the Z configuration, due to the highest number of bunches, which corresponds to the smallest bunch spacing. The presence of a large electron density in the beam pipe can limit the achievable performance of the accelerator through different effects like transverse instabilities, transverse emittance growth, particle losses, vacuum degradation and additional heat loads of the inner surface of the vacuum chambers. In the design phase, the goal is to suppress the e-cloud effects in FCC-ee and, therefore, a preliminary study to identify the parameters, which play a significant role in the e-cloud formation has been performed.

In this paper, an extensive e-cloud simulation study is presented. In particular, the impact of the e-cloud is studied for different configurations, for example: for the electron and the positron beam; in the different elements of the particle accelerator; changing the beam chamber geometry; for different values of the Secondary Emission Yield (SEY); and for different beam parameters.

### Funding Agency

### Footnotes

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

Yes

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