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Beam loading effects in standing-wave linacs and their implementation into the particle tracking code RF-Track

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Accelerating technology is evolving towards compactness and high intensity. In such a scenario, beam loading effects result in significant energy losses for long trains of bunches. To address these effects, we generalised the Beam Loading module of the tracking code RF-Track to allow the study of beam loading independently of the particle type and velocity or the accelerating cavity design. This paper describes the implementation of this effect in standing wave (SW) structures. Particular attention has been devoted to guns for photoinjectors, where causality plays an important role, and one must address the non-ultrarelativistic behaviour of the emitted particles. Finally, we will discuss the simulation of these effects in the CLEAR facility at CERN.

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Footnotes

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Yes

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