Contribution ID: **912** Contribution code: **TUPS014** Type: **Poster Presentation**

Accelerating wakefield that reduces the energy spread of the witness due to beam loading

Tuesday 3 June 2025 16:00 (2 hours)

Acceleration by the wakefield in the plasma can provide compact sources of relativistic electron bunches of high brightness. Free electron lasers and particle colliders, for using plasma wakefield accelerators, require high efficiency and bunches with low energy spread. The best way to achieve low energy spread is using profiled bunches which form plateau on the wakefield. However, in experimental setups it is easier to use gaussian-kind bunches. Our numerical investigations show that thus form of bunches can assure plateau on the central part of the bunch, higher accelerating field on the tail of the bunch and lower accelerating field on its head. This field distribution leads to decreasing of the energy spread of bunches.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

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Session Classification: Tuesday Poster Session

Track Classification: MC3: Novel Particle Sources and Acceleration Techniques: MC3.A22 Plasma Wakefield Acceleration