



Contribution ID: 1644 Contribution code: MOPR38

Type: **Poster Presentation**

An LWFA injector for AWAKE Run 2 experiment

Monday, 20 May 2024 16:00 (2 hours)

A beam physics design has been carried out for a 200 MeV-LWFA injector to the AWAKE Run 2 experiment as an alternative to the reference RF injector. It is composed of a laser-plasma acceleration stage and a transport line. In addition to specific environment constraints that impose a dogleg configuration, the electron beam must feature unprecedented performances for a plasma-based accelerator: 100 pC charge, a few mm·mrad emittance, and a few % energy spread. Thanks to an integrated beam physics study assigning specific roles to each section of the accelerator, all the requirements are successfully met in numerical simulations, paving the way for plasma-based accelerators to be competitive with conventional accelerators.

Footnotes

Funding Agency

Paper preparation format

Region represented

Europe

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Session Classification: Monday Poster Session

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