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Beam characterization and optimisation for AWAKE 18 MeV electron line

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After the successful conclusion of Run1 in 2018, the AWAKE experiment is presently undergoing its second phase (Run2), which aims to demonstrate the possibility of producing high quality electron beams for high energy physics applications.
Over the last year, a significant time-investment was made to study proton beam centroid modulation effects in plasma induced by a seeding electron bunch (i.e. hosing). The high beam pointing accuracy needed for the study translated in tighter constraints for the 18 MeV electrons injection line. To address the new requirements, a measurements campaign was dedicated to the characterization and optimization of the beam line. In the first part of this paper, we present the results of the measurements and simulations carried out for the line characterization. The second part focuses on the description of the operational tools developed to address the new beam requirements and performance.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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