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Design of the new 18 MeV electron injection line for AWAKE Run2c

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The Advanced Wakefield Experiment (AWAKE) has demonstrated during its first run (Run1, concluded in 2018) the capability of accelerating electrons up to the energy of 2 GeV using proton driven plasma wakefield acceleration.

AWAKE Run 2 has started and during the third phase of the program, Run 2c, which aims to demonstrate stable accelerating gradients of 0.5-1 GV/m and emittance preservation of the electron bunches during acceleration, the layout of the experiment will be modified to accommodate a second plasma cell. Among the many changes, the position of the primary 18 MeV electron beam line will be shifted. The beam line layout and optics will need, therefore, to be redesigned to fit the new footprint constraints and match the new beam requirements.

This paper presents the proposed layout of the new 18 MeV line, detailing the constraints and specifications, describing the design procedure and showing the main results.

Funding Agency

Footnotes

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Yes

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