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AWAKE: Towards high-energy electrons for particle physics experiments

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The Advanced Wakefield Experiment, AWAKE, at CERN is an accelerator R&D experiment, which moved from a proof-of-concept experiment to a facility that develops the proton-driven plasma wakefield acceleration technology to be ready for proposing first particle physics applications in the 2030's. The AWAKE program aims to accelerate electrons to energies of 10 to 100 GeV in a single plasma source, while controlling the beam quality and demonstrating the scalability of the process.
This talk gives a summary of the recent results of the self-modulator experiments for the long proton drive bunch and presents the program, experimental layout and challenges of the electron acceleration experiment where a 150 MeV, 100pC charge, 200fs long electron bunch is externally injected into a 10m -long accelerator plasma source. In addition the development of scalable discharge and helicon plasma sources to hundreds of meters length, necessary to reach high energies, is shown.

Secondary track

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