

Recent highlights and plans of the AWAKE experiment

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The Advanced Wakefield Experiment (AWAKE) is an accelerator R&D experiment at CERN using, for the first time, a high-energy proton bunch to drive wakefields in plasma and accelerating electrons to the GeV energy scale. The principle of the AWAKE experiment is described. We show experimental results of the seeded self-modulation process of the long 400 GeV SPS proton bunch, transforming the bunch into a train of micro-bunches and driving resonantly the wakefields in the 10 m long Rb plasma. We also show that externally-injected electrons can be accelerated by these wakefields to several GeV. The next steps of the AWAKE experimental programme are shown. Possible first applications to high-energy physics experiments, where the scheme takes advantage of the large energy stored in the proton bunch to reach very high energy gain in a single plasma, are described.

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