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Pushing to new particle energy frontiers with plasma wakefield acceleration

The construction of ever larger and costlier accelerator facilities has its limits, and new technologies will be needed to push the energy frontier. Plasma wakefield acceleration is a rapidly developing field which appears to be a auspicious candidate technology for future high-energy accelerators providing acceleration gradients a factor 10 to 1000 larger than in conventional radio-frequency metallic cavities used in current accelerators. This presentation introduces the plasma wakefield acceleration technology, shows the technological challenges, gives an overview of the state of the art and shows promising results on the example of the advanced proton driven plasma wakefield experiment, AWAKE, at CERN.

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