

Abstract Submitted
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Program and Plan for AWAKE Run 2 at CERN EDDA GSCHWENDTNER, CERN, AWAKE COLLABORATION COLLABORATION — The AWAKE Run2 experiment at CERN aims to achieve high-charge bunches of electrons accelerated to high energy (about 10 GeV) while maintaining beam quality and showing that the process is scalable. By the end of Run 2 AWAKE should be in the position to use that scheme for first particle physics applications. AWAKE Run 2 consists of four phases: Run 2a starting in 2021 will use the existing AWAKE¹ facility to investigate the seeding of the self-modulation with the current electron beam. In Run 2b, a new plasma source with a density step will be implemented in order to maintain strong and constant acceleration fields. In Run 2c a new high energy (150MeV) electron beam system and a second plasma source will be installed to demonstrate the electron acceleration to high energies and keeping good emittance. In Run 2d the second plasma source will be replaced with a scalable one, which could be used for long-distance acceleration for first applications once demonstrated. An overview of the four phases of AWAKE Run 2 will be given. The technical challenges as well as the proposed schedule will be shown. ¹E. Gschwendtner, M. Turner et al. (The AWAKE Collaboration), *Phil. Trans. R. Soc. A* 377: 20180418 (2019).

Edda Gschwendtner
CERN

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