



Contribution ID: 22

Type: poster

Simulations of the possible AWAKE Run-2 experiment at CERN

Monday, 25 September 2017 19:30 (1 hour)

The AWAKE Run-2 is a possible extension of the current AWAKE experiment on the proton driven plasma wakefield acceleration using the 400 GeV beam from the CERN SPS accelerator. The current AWAKE experiment is aimed at the proof-of-principle demonstration of electron acceleration driven by a self-modulating proton beam in plasma, while the focus of the proposed AWAKE Run-2 experiment will be on application of this technology for acceleration of electron bunch with a reasonably high quality and intensity. A better quality of accelerated electron beam can be achieved by injecting the short and intense electron bunch after the stabilization of self-modulating proton beam over the first 7-10 m of plasma. 2D and 3D quasi-static PIC simulations of the proposed experiment will be presented.

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Session Classification: Wine and Poster Session 1(WG1-WG2-WG3-WG8)

Track Classification: WG1 - Electron Beams from Plasmas