Contribution ID: **214** Type: **poster**

SINGLE-STAGE LASER-DRIVEN PLASMA ACCELERATION WITH EXTERNAL INJECTION FOR EuPRAXIA

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

The EuPRAXIA (European Plasma Research Accelerator with eXcellence In Applications) project aims at producing a conceptual design for the European plasma-based accelerator facility, capable of delivering high quality multi-GeV electron beams. This facility will be used for various user applications, including free-electron-lasers and high-energy physics detector tests. EuPRAXIA explores different approaches to plasma acceleration techniques. Laser-driven plasma wakefield acceleration with external injection of an RF-generated electron beam is one of the basic configurations explored. We present studies of electron beam acceleration to several GeV by a single-stage laser wakefield accelerator with external injection from an RF accelerator as a first step towards a 5 GeV electron beam. Electron beam injection, acceleration and extraction from the plasma are investigated using particle-in-cell simulations.

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

Track Classification: WG1 - Electron Beams from Plasmas