Contribution ID: **273** Type: **poster**

Time and space characterization of a laser pulse for a new multi-pulse LWFA design

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

The use of laser pulse trains is one of the promising methods to achieve laser wakefield acceleration because of the low-energy requirements and high repetition rate.
A new design for the generation of a suitable train of pulses from a single highenergy fast pulse is presented, exploiting optical properties of the main pulse impacting, just before the last focusing mirror, on a "mask"sectioned in concentric zones with different thickness, in order to deliver multiple laser pulses. A hole in the middle of the mask lets part of the original pulse to pass through and provide electron injection.
In the poster we will show how spatial and temporal profile of the laser emerging from each section are related to their radius and thickness. In particular we use (i) a self-developed code based on diffraction theory to calculate the e.m. field at the focus plane of an off-axis parabolic mirror, (ii) Mirò simulations to evaluate the effects on the pulse duration (iii) analytical solution for the time separation of the pulses. From this characterization it is possible to perform plasma wakefield simulations and use the results as feedback for the choice of different mask's parameters.

Primary author: VANTAGGIATO, Gianluca (Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche)

Co-authors: GIZZI, Leonida Antonio (PI); LABATE, Luca Umberto (PI); Dr TOMASSINI, Paolo (INO-CNR)

Presenter: VANTAGGIATO, Gianluca (Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche)

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

Track Classification: WG1 - Electron Beams from Plasmas