



Contribution ID: 285

Type: talk

Review of laser-plasma acceleration scaling in quasi-linear and blowout regimes

Wednesday, September 27, 2017 8:30 AM (40 minutes)

The majority of research on laser-plasma acceleration of electrons can be broadly categorized as belonging to either the quasi-linear regime, or the nonlinear blowout regime. The quasi-linear regime is characterized by nearly linear wakes, pre-formed channel guiding, and some auxiliary process to inject an initial population of electrons into the wake. The blowout regime is characterized by self-guiding, and usually self-injection. Most experimental success has been in the blowout regime, perhaps because of the relative simplicity of configuration. The scaling of accelerated beam parameters with laser and plasma parameters has been explored in the literature for both regimes. We will review these scalings in the context of both single and multi-stage accelerator concepts, considering issues of size, power consumption, energy, beam quality, and suitability for applications. Comparison of analytical, numerical, and experimental results will be discussed where possible.

Primary author: GORDON, Daniel (Naval Research Laboratory, Plasma Physics Division, Washington D.C., USA)

Co-authors: TING, Antonio (University of Maryland, College Park, Maryland, USA); HAFIZI, Bahman (Naval Research Laboratory, Plasma Physics Division, Washington D.C., USA); KAGANOVICH, Dmitri (Naval Research Laboratory, Plasma Physics Division, Washington D.C., USA); HELLE, Michael (Naval Research Laboratory, Plasma Physics Division, Washington D.C., USA); HUBBARD, Richard F. (Naval Research Laboratory, Plasma Physics Division, Washington D.C., USA); CHEN, Yu-hsin (Research Support Instruments, Inc., Lanham, Maryland, USA)

Presenter: GORDON, Daniel (Naval Research Laboratory, Plasma Physics Division, Washington D.C., USA)

Session Classification: Plenary 5

Track Classification: Invited Plenary Talk