Contribution ID: 34

Type: talk

Transport line for a multi-staged laser-plasma acceleration: DACTOMUS

Tuesday, 4 June 2013 19:12 (15 minutes)

The laser-plasma acceleration is one of the most promising techniques to reach very high acceleration gradients of about 100 GeV/m. In order to push this acceleration scheme in the domain of the very high energies, the Equipex project CILEX was launched with the laser APOLLON. One of the main topics of this project is to study the multi-staged acceleration. It consists in generating and pre-accelerating the electrons in a first laser-plasma stage to transport them up to a second stage where the electrons are accelerated again thanks to another laser pulse. The project DACTOMUS relies on a collaboration CEA-IRFU, LAL and LLR, and tends to the study and realization of such a transport line between these two stages.

Firstly, a prototype will be developed and tested by the groups of CEA-IRAMIS-SPAM / LPGP and LULI on the installation UHI100 (CEA-SPAM). This collaboration must enable to realize the first acceleration stage. For the transport line prototype, the main difficulties are to realize a very compact and a very energy accepting line with diagnostics to characterize the electron beam. We will present here the optics of this line, its performances and the inserted diagnostics.

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Session Classification: WG1+4

Track Classification: WG1+4