IAEA FEC 2014

Contribution ID: **820** Type: **Poster**

Overview of the results of the ABC facility at ENEA-Frascati

Thursday 16 October 2014 14:00 (4h 45m)

The laboratory for inertial confinement fusion is dedicated to the study of laser produced plasmas in the 2 beams laser facility ABC, which can deliver up to 200 J in pulses of 3 nanosecond duration. The system is suitable for irradiating planar targets at I =10exp14-15 Wcm-2. This paper summarizes the main research programs brought forward in the last year.
Theoretical and experimental investigations have been dedicated to the study of porous absorbers and to the measurements of their homogenizing properties. The efficiency with which the laser energy is absorbed and transmitted after conversion to a shock wave in the plasma is measured by the volumes of craters left on the metal holders. Shadowgraphic images and time resolved interferometry are used to study the density behavior. Numerical simulation of the hydrodynamic stability of the plasma are also under study with the Multi2D code [4].
The possibility of producing the proton Boron fusion reaction p + 11B = 3alfa in a laser produced plasma are also studied at laser intensities up to 10exp15 Wcm-2. The tracks observed on CR 39 detectors are compared with numerical prediction in order to define if they are α particles originating form pB fusion reactions.
The emission of electromagnetic waves in the radiofrequency-microwave range has been observed in many experiments of laser-plasma interaction. The spectral range of these waves can reach several gigahertz and can be of very high intensity representing a source of noise and a possible limitation on the use of some detectors. In this work we describe the measurements of this electromagnetic pulse, under different conditions of laser-plasma interaction and for different kind of targets[5].
References:

[1] S.Yu. Gus'kov et al, JETP 81, 296 (1995);
[2] S.Yu. Gus'kov et al, Laser Part. Beams 17, 287 (1999);
[3] R. De Angelis et a,.Proceedings of the IFSA conference 2013 –Nara
[4] R. Ramis, J. Meyer –ter-Vehn,J.Ramirez Computer Physics Communications, Volume 180, Issue 6, June 2009, Pages 977-994
[5] Proceedings of ICFTD 2013 , Frascati, Rome.

Country or International Organisation

Italy

Paper Number

PD/P6-4

Author: Dr DE ANGELIS, Riccardo (Italy)

Co-authors: Dr BONASERA, Aldo (INFN - LNS, via S. Sofia 62, I-95123 Catania, Italy); Dr CURCIO, Alessandro (Dipartimento di Fisica "E.Fermi" dell'Università di Pisa, Pisa, Italy); Dr VERONA, Claudio (Dipartimento di Ingegneria Industriale, Università di Tor Vergata, Rome, Italy); Dr GIULIETTI, Danilo (Dipartimento di Fisica "E.Fermi"

dell'Università di Pisa, Pisa, Italy); Dr CONSOLI, Fabrizio (Unità Tecnica Fusione - ENEA C. R. Frascati - via E. Fermi 45, 00044 Frascati (Roma), Italy); Dr INGENITO, Francesco (Unità Tecnica Fusione - ENEA C. R. Frascati - via E. Fermi 45, 00044 Frascati (Roma), Italy); Dr VERONA RINATI, Gianluca (Dipartimento di Ingegneria Industriale, Università di Tor Vergata, Rome, Italy); Mr DI GIORGIO, Giorgio (Unità Tecnica Fusione - ENEA C. R. Frascati - via E. Fermi 45, 00044 Frascati (Roma), Italy); Mr CRISTOFARI, Giuseppe (Unità Tecnica Fusione - ENEA C. R. Frascati - via E. Fermi 45, 00044 Frascati (Roma), Italy); Dr CALAMOSCA, Massimo (ENEA, Istituto di radioprotezione, via dei Colli 16, I-40136 Bologna, Italy); Dr BARBARINO, Matteo (INFN - LNS, via S. Sofia 62, I-95123 Catania, Italy); Dr CIPRIANI, Mattia (Unità Tecnica Fusione - ENEA C. R. Frascati - via E. Fermi 45, 00044 Frascati (Roma), Italy); Dr KALAL, Milan (Fac. of Nucl.Sciences and Phys.Engin.,Czech Techn.Univ. in Prague, Prague,Czech Rep.); Mr ANDREOLI, Pierluigi (Unità Tecnica Fusione - ENEA C. R. Frascati - via E. Fermi 45, 00044 Frascati (Roma), Italy); Prof. GUS'KOV, Sergey Yu (Lebedev Physical Institute, Russian Academy of Sciences, Moscow, Russia); Dr RUPASOV, alexander (Lebedev Physical Institute, Russian Academy of Sciences, Moscow, Russia)

Presenter: Dr DE ANGELIS, Riccardo (Italy)

Session Classification: Poster 6

Track Classification: IFE - Inertial Fusion Experiments and Theory