

# JOURNAL OF PLASMA AND FUSION RESEARCH

*The Journal of the Japan Society of Plasma Science and Nuclear Fusion Research*

Vol. 90, No.8, August 2014

## Special Topic Articles

Scientific and Technological Prospects of High Intensity High Average Power Lasers  
toward Plasma and Fusion Researches

1. Introduction .....	SASAKI Akira and KONDO Kiminori	435
2. New Turn on High Power Laser with Novel Material and Beam Combining Technique, and its Contribution to Laser Fusion Research .....	KAWANAKA Junji	440
3. Ultra-Short Pulse, Ultra-High Intensity Laser Improvement Techniques for Laser-Driven Quantum Beam Science .....	KIRIYAMA Hiromitsu and KANDO Masaki	449
4. High Brightness and High Average Power Laser Research with Optimization for Short Wavelength Light Sources .....	ENDO Akira and MIZOGUCHI Hakaru	456
5. High Intensity, High Repetition-Rate Laser System Based on a Ring-Enhancement Cavity Technology .....	KOBAYASHI Yohei	462
6. Summary .....	SASAKI Akira and KONDO Kiminori	468
Glossary .....		470

## Special Topic Articles

Contribution of Linear Plasma Devices to Boundary Plasma and Plasma-Wall Interaction Researches towards DEMO

1. Present Status of Linear Plasma Devices and Issues on DEMO Divertor Design .....	SAKAMOTO Mizuki, OHNO Noriyasu, ASAKURA Nobuyuki and HOSHINO Kazuo	473
2. Divertor Heat Flux Control and Plasma-Material Interaction .....	KIKUCHI Yusuke, SAWADA Keiji, TAKAMURA Shuichi, UEDA Yoshio and NAGATA Masayoshi	480
3. Plasma-Wall Interaction Studies using Linear Plasma Devices .....	HATANO Yuji, MIYAMOTO Mitsutaka, SHIMADA Masashi, UEDA Yoshio and TOKITANI Masayuki	489
4. Summary .....	NAKASHIMA Yousuke	496

## Lecture Note

Advanced Simulation Techniques of Particle-in-Cell Code for High Density Relativistic Plasma

6. Radiation Transport and Nuclear Reaction Models for Particle Simulations .....	JOHZAKI Tomoyuki and SENTOKU Yasuhiko	500
--	---------------------------------------	-----

PFR Abstracts .....	505
---------------------	-----

Information .....	506
-------------------	-----

Plasma & Fusion Calendar .....	516
--------------------------------	-----

Announcement .....	518
--------------------	-----

## Cover

Relativistic electron beam (REB) generated from high intense PW LFEX laser propagates inside a solid target. The trajectory of the electrons is simulated with scattering and energy loss. For a high-Z material (Ta,  $Z = 73$ ), only energetic electrons with energy  $E > 100$  keV can propagate inside. The penetration depth increases with the electron energy and part of the electron with  $E > 5$  MeV can propagate through the 1 mm Ta and escape from the rear surface. (Zhe ZHANG *et al.*, Plasma and Fusion Research Vol.9, 1404118 (2014) <http://www.jspf.or.jp/PFR/>)

Published Monthly by

The Japan Society of Plasma Science and Nuclear Fusion Research

3-1-1, Uchiyama, Chikusa-ku, Nagoya 464-0075, Japan

Tel 052-735-3185, Fax 052-735-3485, E-mail: plasma@jpsf.or.jp, URL: <http://www.jspf.or.jp/>