

Matter and Radiation at Extremes

Volume 2, Issues 1–6, 2017

Table of Contents

Fundamental Physics at Extremes

Review

Electron-positron pair production in ultrastrong laser fields

Bai Song Xie, Zi Liang Li, Suo Tang

225–242

Research article

Transport properties of warm and hot dense iron from orbital free and corrected Yukawa potential molecular dynamics

H.Y. Sun, Dongdong Kang, Yong Hou, J.Y. Dai

287–295

Laser- and Particle Beam Fusion

Letter

Non-equilibrium between ions and electrons inside hot spots from National Ignition Facility experiments

Zhengfeng Fan, Yuanyuan Liu, Bin Liu, Chengxin Yu, Ke Lan, Jie Liu

3–8

Reviews

Laser-direct-drive program: Promise, challenge, and path forward

E.M. Campbell, V.N. Goncharov, T.C. Sangster, S.P. Regan, P.B. Radha, R. Betti, J.F. Myatt, D.H. Froula, M.J. Rosenberg, I.V. Igumenshchev, W. Seka, A.A. Solodov, A.V. Maximov, J.A. Marozas, T.J.B. Collins, D. Turnbull, F.J. Marshall, A. Shvydky, J.P. Knauer, R.L. McCrory, A.B. Sefkow, M. Hohenberger, P.A. Michel, T. Chapman, L. Masse, C. Goyon, S. Ross, J.W. Bates, M. Karasik, J. Oh, J. Weaver, A.J. Schmitt, K. Obenschain, S.P. Obenschain, S. Reyes, B. Van Wousterghem

37–54

Optimization of laser illumination configuration for directly driven inertial confinement fusion

Masakatsu Murakami, Daiki Nishi

55–68

P3: An installation for high-energy density plasma physics and ultra-high intensity laser–matter interaction at ELI-Beamlines

S. Weber, S. Bechet, S. Borneis, L. Brabec, M. Bučka, E. Chacon-Golcher, M. Ciappina, M. DeMarco, A. Fajstavr, K. Falk, E.-R. Garcia, J. Grosz, Y.-J. Gu, J.-C. Hernandez, M. Holec, P. Janečka, M. Jantač, M. Jirka, H. Kadlecova, D. Khikhlikha, O. Klimov, G. Korn, D. Kramer, D. Kumar, T. Lastovička, P. Lutoslawski, L. Morejon, V. Olšovcová, M. Rajdl, O. Renner, B. Rus, S. Singh, M. Šmid, M. Sokol, R. Versaci, R. Vrána, M. Vranic, J. Vyskočil, A. Wolf, Q. Yu

149–176

Laser performance upgrade for precise ICF experiment in SG-III laser facility

Wanguo Zheng, Xiaofeng Wei, Qihua Zhu, Feng Jing, Dongxia Hu, Xiaodong Yuan, Wanjun Dai, Wei Zhou, Fang Wang, Dangpeng Xu, Xudong Xie, Bin Feng, Zhitao Peng, Liangfu Guo, Yuanbin Chen, Xiongjun Zhang, Lanqin Liu, Donghui Lin, Zhao Dang, Yong Xiang, Rui Zhang, Fang Wang, Huaiting Jia, Xuewei Deng

243–255

Research articles

Effects of mode coupling between low-mode radiation flux asymmetry and intermediate-mode ablator roughness on ignition capsule implosions

Jianfa Gu, Zhensheng Dai, Shiyang Zou, Wenhua Ye, Wudi Zheng, Peijun Gu, Shaoping Zhu

9–15

Aluminum X-ray mass-ablation rate measurements

J.L. Kline, J.D. Hager

16–21

Analysis of hohlraum energetics of the SG series and the NIF experiments with energy balance model	
Guoli Ren, Jie Liu, Wenyi Huo, Ke Lan	22–27
On intense proton beam generation and transport in hollow cones	
J.J. Honrubia, A. Morace, M. Murakami	28–36
P2 asymmetry of Au's M-band flux and its smoothing effect due to high-Z ablator dopants	
Yongsheng Li, Chuanlei Zhai, Guoli Ren, Jianfa Gu, Wenyi Huo, Xujun Meng, Wenhua Ye, Ke Lan, Weiyang Zhang	69–76
First experimental comparisons of laser-plasma interactions between spherical and cylindrical hohlraums at SGIII laser facility	
Yaohua Chen, Zhichao Li, Xufei Xie, Chunyang Zheng, Chuanlei Zhai, Liang Hao, Dong Yang, Wenyi Huo, Guoli Ren, Jie Liu, Xiaoshi Peng, Tao Xu, Yulong Li, Sanwei Li, Zhiwen Yang, Liang Guo, Lifei Hou, Yonggang Liu, Huiyue Wei, Xiangming Liu, Weiyi Cha, Yukun Li, Keli Deng, Zheng Yuan, Xiayu Zhan, Haijun Zhang, Baibin Jiang, Wei Zhang, Kai Du, Xuewei Deng, Yongkun Ding, Xiaofeng Wei, Wanguo Zheng, Xiaodong Chen, Xiantu He, Ke Lan	77–86
Non-thermal laser driven plasma-blocks for proton boron avalanche fusion as direct drive option	
Heinrich Hora, Shalom Eliezer, Noaz Nissim, Paraskevas Lalouis	177–189
Stimulated Raman scattering excited by incoherent light in plasma	
Yao Zhao, Suming Weng, Min Chen, Jun Zheng, Hongbin Zhuo, Zhengming Sheng	190–196
Effect of molecular weight on the quality of poly(alpha-methylstyrene) mandrel	
Xiuyun Shangguan, Sufen Chen, Shuang Ma, Meifang Liu, Changhuan Tang, Yong Yi, Zhanwen Zhang	197–203
Laser radiation pressure proton acceleration in gaseous target	
V.K. Tripathi, Tung-Chang Liu, Xi Shao	256–262
A tabletop, ultrashort pulse photoneutron source driven by electrons from laser wakefield acceleration	
X.J. Jiao, J.M. Shaw, T. Wang, X.M. Wang, H. Tsai, P. Poth, I. Pomerantz, L.A. Labun, T. Toncian, M.C. Downer, B.M. Hegelich	296–302

Magnetic Driven Fusion

Review

Overview of wall probes for erosion and deposition studies in the TEXTOR tokamak	
M. Rubel, S. Brezinsek, J.W. Coenen, A. Huber A. Kirschner, A. Kreter, P. Petersson, V. Philipps, A. Pospieszczyk, B. Schweer, G. Sergienko, T. Tanabe, Y. Ueda, P.Wienhold	87–104

Research article

Formation of Field Reversed Configuration (FRC) on the Yingguang-I device	
Qizhi Sun, Xianjun Yang, Yuesong Jia, Lulu Li, Dongfan Fang, Xiaoming Zhao, Weidong Qin, Zhengfen Liu, Wei Liu, Jun Li, Yuan Chi, Xiaoguang Wang	263–274

Pulsed Power Technology and High Power Electromagnetics

Reviews

Review of supershort avalanche electron beam during nanosecond-pulse discharges in some gases	
Victor F. Tarasenko, Cheng Zhang, Evgenii Kh. Baksht, Alexander G. Burachenko, Tao Shao, Dmitry V. Beloplotov, Mikhail I. Lomaev, Ping Yan, Andrey V.Kozyrev, Natalia S. Semeniuka	105–116
The pulsed high magnetic field facility and scientific research at Wuhan National High Magnetic Field Center	
Xiaotao Han, Tao Peng, Hongfa Ding, Tonghai Ding, Zengwei Zhu, Zhengcai Xia, Junfeng Wang, Junbo Han, Zhongwen Ouyang, Zhenxing Wang, Yibo Han, Houxiu Xiao, Quanliang Cao, Yiliang Lv, Yuan Pan, Liang Li	278–286

Research articles

- Investigation of Al plasmas from thin foils irradiated by high-intensity extreme ultraviolet**
E.V. Grabovski, P.V. Sasorov, A.P. Shevelko, V.V. Aleksandrov, S.N. Andreev, M.M. Basko, A.V. Branitski, A.N. Gritsuk, G.S. Volkov, Ya.N. Laukhin, K.N. Mitrofanov, G.M. Oleinik, A.A. Samokhin, V.P. Smirnov, I. Yu. Tolstikhin, I.N. Frolov, O.F. Yakushev 129–138
- Conceptual design of a 15-TW pulsed-power accelerator for high-energy-density–physics experiments**
R.B. Spielman, D.H. Froula, G. Brent, E.M. Campbell, D.B. Reisman, M.E. Savage, M.J. Shoup III, W.A. Stygar, M.L. Wisher 204–223
- Lifetime and shelf life of sealed tritium-filled plasma focus chambers with gas generator**
B.D. Lemeshko, A.K. Dulatov, Yu V. Mikhailov, I.A. Prokuratov, A.N. Selifanov, T.S. Fatiev, V.G. Andreev 303–308
-

High Pressure Physics and Materials Science**Discussion**

- Public debate on metallic hydrogen to boost high pressure research**
Hua Y. Geng 275–277

Review

- In situ determination of crystal structure and chemistry of minerals at Earth’s deep lower mantle conditions**
Hongsheng Yuan, Li Zhang 117–128

Research article

- Experimental investigation of the reaction-build-up for plastic bonded explosive JOB-9003**
Xu Zhang, Yanfei Wang, Feng Zhao, Rong Zhang, Bin Zhong 139–148
-

Editorial

- Editorial for special issue on laser fusion**
Ke Lan, Mike Campbell 1–2
-