

111  
pg/sj

JOURNAL  
OF THE  
PHYSICAL  
SOCIETY  
OF  
JAPAN

2014 9 September

VOL. 83  
<http://jpsj.jps.jp/>

# JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN

Volume 83, Number 9, September 2014

## CONTENTS

### ■ LETTERS

#### Electromagnetism, optics, acoustics, heat transfer, classical mechanics, and fluid mechanics

- 093401 Up-Converted Luminescence of a Two-Level Molecule with Population Inversion (4 pages) Ryosuke Hata, Nobuhiko Yokoshi, Hiroshi Ajiki, Hajime Ishihara

#### Condensed matter: structure and mechanical and thermal properties

- 093601 Collapse of CuO Double Chains and Suppression of Superconductivity in High-Pressure Phase of  $\text{YBa}_2\text{Cu}_4\text{O}_8$  (4 pages) Atsuko Nakayama, Yusuke Onda, Shuhei Yamada, Hiroshi Fujihisa, Masafumi Sakata, Yuki Nakamoto, Katsuya Shimizu, Satoshi Nakano, Ayako Ohmura, Fumihiro Ishikawa, Yuh Yamada

#### Condensed matter: electronic structure and electrical, magnetic, and optical properties

- 093701 A Poor Man's Derivation of Quantum Compass–Heisenberg Interaction: Superexchange Interaction in  $J$ – $J$  Coupling Scheme (4 pages) Hiroyasu Matsunura, Masao Ogata
- 093702 Superconductivity of 2.2 K under Pressure in Helimagnet CrAs (4 pages) Hisashi Kotegawa, Shingo Nakahara, Hideki Tou, Hitoshi Sugawara
- 093703 Anomalous Superconducting-Gap Structure of Slightly Overdoped  $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$  (4 pages) Tetsuya Hajiri, Takahiro Ito, Masaharu Matsunami, Byeong Hun Min, Yong Seung Kwon, Shin-ichi Kimura
- 093704 Successive Magnetic Transitions of  $\text{Ca}_2\text{CoSi}_2\text{O}_7$  in High Magnetic Fields (4 pages) Mitsuru Akaki, Hideki Kuwahara, Akira Matsuo, Koichi Kindo, Masashi Tokunaga
- 093705 Superconducting Transition Temperatures of up to 47 K from Simultaneous Rare-Earth Element and Antimony Doping of 112-Type  $\text{CaFeAs}_2$  (4 pages) Kazutaka Kudo, Yutaka Kitahama, Kazunori Fujimura, Tasuku Mizukami, Hiromi Ota, Minoru Nohara
- 093706 Superconductivity in Noncentrosymmetric Iridium Silicide  $\text{Li}_2\text{IrSi}_3$  (5 pages) Sunseong Pyon, Kazutaka Kudo, Jun-ichi Matsumura, Hiroyuki Ishii, Genta Matsuo, Minoru Nohara, Hajime Hojo, Kengo Oka, Masaki Azuma, V. Ovidiu Garlea, Katsuaki Kodama, Shin-ichi Shamoto
- 093707 Gapless Spin-Liquid Phase in an Extended Spin 1/2 Triangular Heisenberg Model (4 pages) Ryuji Kaneko, Satoshi Morita, Masatoshi Imada

#### Cross-disciplinary physics and related areas of science and technology

- 093801 Independent Noise Enhances Synchronization in Heterogeneous Systems (5 pages) Go Uchida, Manabu Tanifugi

### ■ FULL PAPERS

#### General

- 094001 Typical Pure States and Nonequilibrium Processes in Quantum Many-Body Systems (5 pages) Takaaki Monnai, Ayumu Sugita

#### Atomic and molecular physics

- 094301 Intensity of Diffracted X-rays from Biomolecules with Radiation Damage Caused by Strong X-ray Pulses (5 pages) Takeshi Kai, Atsushi Tokuhisa, Kengo Moribayashi, Yuji Fukuda, Hidetoshi Kono, Nobuhiro Go
- 094302 Aharonov–Bohm Effect in the Photodetachment Microscopy of Hydrogen Negative Ions in an Electric Field (5 pages) Dehua Wang

#### Condensed matter: structure and mechanical and thermal properties

- 094601 Pressure Dependence of the Liquid–Liquid Phase Transition of Nanopore Water Doped Slightly with Hydroxylamine, and a Phase Behavior Predicted for Pure Water (7 pages) Atsushi Nagoe, Shinji Iwaki, Masaharu Oguni, Ken-ichi Tōzaki
- 094602 Temperature-Dependent Second Shell Interference in the First Shell Analysis of Crystalline InP X-ray Absorption Spectroscopy Data (6 pages) Claudia S. Schnohr, Leandro L. Araujo, Mark C. Ridgway
- 094603 Ginzburg–Landau Formalism for  $2n$ -Body Condensation (19 pages) Atsushi Tsuruta, Shinya Imamura, Kazumasa Miyake
- 094604 Universality of Anharmonic Motion of Heavy Rare-Earth Atoms in Hexaborides (6 pages) Kazuaki Iwasa, Fumitoshi Iga, Ari Yonemoto, Yuka Otomo, Satoshi Tsutsui, Alfred Q. R. Baron
- 094605 A Density-Matrix Renormalization Group Study of a One-Dimensional Incommensurate Quantum Frenkel–Kontorova Model (6 pages) Yongjun Ma, Jiaxiang Wang, Xinye Xu, Qi Wei, Wenjun Zhu, Sabre Kais

- 094606 Elastic Anisotropy and Anisotropic Transport Properties of Cu<sub>3</sub>SbSe<sub>4</sub> and Cu<sub>3</sub>SbS<sub>4</sub> (*8 pages*) Bin Xu, Xiangdan Zhang, Yunzhou Sun, Jing Zhang, Yusheng Wang, Lin Yi
- Condensed matter: electronic structure and electrical, magnetic, and optical properties**
- 094701 On the Possible Zero-Gap State in Organic Conductor  $\alpha$ -(BEDT-TSF)<sub>2</sub>I<sub>3</sub> under Pressure (*5 pages*) Takao Morinari, Yoshikazu Suzumura
- 094702 Ferromagnetic Half Metallicity in Doped Chalcopyrite Semiconductors Cu(Al<sub>1-x</sub>A<sub>x</sub>)Se<sub>2</sub> ( $A = 3d$  Transition-Metal Atoms) (*5 pages*) Mohammad Shahjahan, Masayuki Toyoda, Tamio Oguchi
- 094703 Coexistence of Antiferromagnetism and Superconductivity in Iron-Based Superconductors (*5 pages*) Yasunori Matsui, Takao Morinari, Takami Tohyama
- 094704 Decay Processes of Si 2s Core Holes in Si(111)-7 × 7 Revealed by Si Auger Electron Si 2s Photoelectron Coincidence Measurements (*5 pages*) Kazuhiko Mase, Kenta Hiraga, Sadanori Arae, Rui Kanemura, Yusaku Takano, Kotaro Yanase, Yosuke Ogashiwa, Nariaki Shohata, Noritsugu Kanayama, Takuhiro Kakiuchi, Shinya Ohno, Daiichiro Sekiba, Koji K. Okudaira, Makoto Okusawa, Masatoshi Tanaka
- 094705 Dynamical Conductivity of Dirac Electrons in Organic Conductors (*9 pages*) Yoshikazu Suzumura, Igor Proskurin, Masao Ogata
- 094706 Coexistence and Competition of Magnetic and Charge Orders in an Extended Kondo Lattice Model for Sm Skutterudite (*7 pages*) Ryousuke Shiina
- 094707 A DFT+U Study of Strain-Dependent Ionic Migration in Sm-Doped Ceria (*8 pages*) Musa Alaydrus, Mamoru Sakaue, Susan M. Aspera, Triati D. K. Wungu, Nguyen H. Linh, Tran P. T. Linh, Hideaki Kasai, Tatsumi Ishihara, Takahiro Mohri
- 094708 The Local-Field Effect on the Optical Transition: an Experimental Probe Using Eu<sup>3+</sup> Diluted in Glass Systems (*4 pages*) Sha Jiang, Jian Yuan, Shaoshuai Zhou, Xiantao Wei, Yonghu Chen, Min Yin, Qingli Zhang, Changkui Duan
- 094709 Dielectric Response of Multiorbital Molecular Compounds (TTM-TTP) $X$  ( $X = \text{AuI}_2$  and I<sub>3</sub>) (*5 pages*) Satoru Sasaki, Satoshi Iguchi, Tadashi Kawamoto, Takehiko Mori, Takahiko Sasaki
- 094710 Weyl Semimetal in the Strong Coulomb Interaction Limit (*8 pages*) Akihiko Sekine, Kentaro Nomura
- 094711 Quasiparticle Self-Consistent GW Method Based on the Augmented Plane-Wave and Muffin-Tin Orbital Method (*11 pages*) Takao Kotani
- 094712 Ab-initio Prediction of Magnetoelectricity in Infinite-Layer CaFeO<sub>2</sub> and MgFeO<sub>2</sub> (*6 pages*) Kunihiko Yamauchi, Tamio Oguchi, Silvia Picozzi
- 094713 Electron Confinement Due to Stacking Control of Atomic Layers in SiC Polytypes: Roles of Floating States and Spontaneous Polarization (*5 pages*) Yu-ichiro Matsushita, Shinnosuke Furuya, Atsushi Oshiyama
- 094714 Dynamics of Photoinduced Phase Transition from a Dimer Mott Insulator to a Metal (*10 pages*) Hiroki Gomi, Takashi Kawatani, Takeshi J. Inagaki, Akira Takahashi
- 094715 Magnetization of a Mesoscopic Superconducting Sr<sub>2</sub>RuO<sub>4</sub> Plate on Micro-dc-SQUIDs (*5 pages*) Shogo Tsuchiya, Misa Matsuno, Ryosuke Ishiguro, Hiromi Kashiwaya, Satoshi Kashiwaya, Shintaro Nomura, Hideaki Takayanagi, Yoshiteru Maeno
- 094716 Electronic Structures and Magnetic Anisotropy Energies of Graphene with Adsorbed Transition-Metal Adatoms (*4 pages*) Huy Duy Nguyen, Tomoya Ono
- 094717 Electronic Structures of Ce $M_2\text{Al}_{10}$  ( $M = \text{Fe, Ru, and Os}$ ) Studied by Soft X-ray Resonant and High-Resolution Photoemission Spectroscopies (*6 pages*) Toshihiko Ishiga, Takanori Wakita, Rikiya Yoshida, Hiroyuki Okazaki, Koji Tsubota, Masanori Sunagawa, Kanta Uenaka, Kozo Okada, Hiroshi Kumigashira, Masaharu Oshima, Keisuke Yutani, Yuji Muro, Toshiro Takabatake, Yuji Muraoka, Takayoshi Yokoya
- 094718 Correlation Strength Crossover of Auger Recombination in One-Dimensional Mott Insulators (*7 pages*) Hiroki Gomi, Hisashi Hatano, Takeshi J. Inagaki, Akira Takahashi
- 094719 Fermi Surface Instabilities in Ferromagnetic Superconductor URhGe (*6 pages*) Dai Aoki, Georg Knebel, Jacques Flouquet
- 094720 Time-Reversal Symmetry in the Hidden Order and Superconducting States of URu<sub>2</sub>Si<sub>2</sub> (*5 pages*) Ikuto Kawasaki, Isao Watanabe, Adrian Hillier, Dai Aoki
- 094721 Superconducting Gap and Symmetry in FeSe<sub>1-x</sub>Te<sub>x</sub> Studied by Specific Heat in Magnetic Fields (*7 pages*) Takuya Konno, Tadashi Adachi, Masato Imaizumi, Takashi Noji, Takayuki Kawamata, Yoji Koike
- 094722 Impurity Effects in a Two-Dimensional Topological Superconductor: A Link of  $T_c$  Robustness with a Topological Number (*5 pages*) Yuki Nagai, Yukihiro Ota, Masahiko Machida
- 094723 Nonmagnetic Impurity Effect on Magnetic Phase Transitions in an Isosceles Triangular Lattice Ising Chain Antiferromagnet CoNb<sub>2</sub>O<sub>6</sub> (*7 pages*) Taro Nakajima, Setsuo Mitsuda, Hidekazu Okano, Yu Inomoto, Satoru Kobayashi, Karel Prokes, Sebastian Gerischer, Peter Smeibidl
- 094724 Appearance of Antiferromagnetic Dipole Order in Ce<sub>0.5</sub>La<sub>0.5</sub>B<sub>6</sub> with Pr Ion Doping (*7 pages*) Takeshi Matsumura, Keisuke Kunimori, Akihiro Kondo, Kei Soejima, Hiroshi Tanida, Jean-Michel Mignot, Fumitoshi Iga, Masafumi Sera