◇◆◇ Preface ◇◆◇

This booklet reports the highlights of researches and the new improvements during FY2017 performed in the HFLSM: High Field Laboratory for Superconducting Materials at Sendai. HFLSM has been developed numbers of new magnets technologies including cryogen-free hybrid magnet and cryogen-free superconducting magnets generating magnetic fields above 20 T. At HFLSM, the unique 25 T cryogen-free superconducting magnet has been operational for user program. Such cryogen-free superconducting magnets surely offer long-term stable and high-quality steady fields. HFLSM offers varieties of hybrid and superconducting magnets for researches in materials science, physics, applied superconductivity, chemistry and other pure and inter-disciplinary sciences performed in steady magnetic fields.

We hope that the booklet helps you to see the overview of our activities and stimulate future research collaborations with domestic and oversea users in HFLSM and in the High Magnetic Field Co-laboratory of Japan.

1 October 2019

Hiroyuki Nojiri

Director of HFLSM

Selected Topics in 2017 – Research Highlight at HFLSM

Vortex Pinning Mechanism in $YBa_2Cu_3O_{7-\delta}$ Films Containing Nanorods 1
T. Horide[1], K. Matsumoto[1] and S. Awaji[2]
[1] Dept. of Mater. Sci. & Eng., Kyushu Inst. Technol.
[2] IMR, Tohoku Univ.

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S. Miura[1], Y. Yoshida[2], Y. Tsuchiya[2], Y. Ichino[2], S. Awaji[3], A. Ichinose[4], K. Matsumoto[5], A. Ibi[6], T. Izumi[6] and M. Iwakuma[1]
[1] Kyushu Univ.
[2] Nagoya Univ.
[3] IMR, Tohoku Univ.
[4] CRIEPI
[5] Kyushu Inst. Technol.
[6] AIST

Superconducting Properties of 100-m Class $Sr_{0.6}K_{0.4}Fe_2As_2$ Tape and Pancake Coils 3
X.P. Zhang[1], H. Oguro[2], C. Yao[1], C.H. Dong[1], Z.T Xu[1], D.L. Wang[1], S. Awaji[2], K. Watanabe[2] and Y.W. Ma[1]
[1] IEE, CAS
[2] IMR, Tohoku Univ.

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[1] Dept. of Phys., Kyoto Univ.
[2] ISSP, Karlsruhe Inst. of Tech.
[3] IMR, Tohoku Univ.

Gapless Magnetic Excitations in the Kagome Antiferromagnet Ca-Kapellasite 5
Y. Ihara[1], T. Sasaki[2], N. Noguchi[1], Y. Ishii[1], M. Oda[1] and H. Yoshida[1]
[1] Dept. of Phys., Hokkaido Univ.
[2] IMR, Tohoku Univ.

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Y. Fujishiro[1], N. Kanazawa[1], J. Shiogai[2], S. Kimura[2], S. Awaji[2], A. Tsukazaki[2], Y. Tokura[1,3] et al.
[1] Dept. of Appl. Phys., Univ. of Tokyo
[2] IMR, Tohoku Univ.
[3] CEMS, RIKEN.

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T. Sakurai[1], S. Kimura[2], M. Kitmata[2], H. Nojiri[2], S. Awaji[2], S. Okubo[3], H. Ohta[3], Y. Uwatoko[4], K. Kudo[5] and Y. Koike[6]

[1] RFCST, Kobe Univ.

[2] IMR, Tohoku Univ.

[3] MPRC, Kobe Univ.

[4] ISSP, Univ. of Tokyo

[5] RIIC, Okayama Univ.

[6] School of Eng., Tohoku Univ.

Collective and Local Excitations in a Highly Frustrated Antiferromagnet 8

P. Chanlert[1], N. Kurita[1], H. Tanaka[1], M. Kimata[2] and H. Nojiri[2]

[1] Dept. of Physics, Tokyo Inst. Technol.

[2] IMR, Tohoku Univ.

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I. Shigeta[1], T. Kubota[2], Y. Sakuraba[3], C. G. Molenaar[4], J. N. Beukers[4], S. Kimura[2], A. A. Golubov[4], A. Brinkman[4], S. Awaji[2], K. Takanashi[2] and M. Hiroi[1]

[1] Grad. School of Sci. and Eng., Kagoshima Univ.

[2] IMR, Tohoku Univ.

[3] NIMS

[4] Fac. of Sci. and Tech., Univ. Twente

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S. Awaji[1], K. Watanabe[1], H. Oguro[1*], H. Miyazaki[2], S. Hanai[2], T. Tosaka[2] and S. Ioka[2]

[1] IMR, Tohoku Univ.

[2] Toshiba Energy Systems Corp.

*present address: Tokai Univ.