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BOOK OF ABSTRACTS

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W3-09. Variation of magnetic properties of bilayered and trilayered NiFe and IrMn-based thin film structures. *C. Gritsenko*[1], V. Rodionova[1], A. Berg[1], G. Babaytsev[2], I. Dzhun[2], N. Chechenin[2], M. Volochaev[3] and A. Sokolov[3] *1. Laboratory of Novel Magnetic Material, Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation; 2. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russian Federation; 3. Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russian Federation*

FRIDAY MORNING 10:00 — SAN FRANCISCO BALLROOM

Session W4
MAGNETIC STRUCTURES AND MAGNETIC PHASE DIAGRAMS (Poster Session)

Alannah Hallas, Co-Chair
Rice University, Houston, TX, United States
Franziska Weickert, Co-Chair
Florida State University, Los Alamos, NM, United States

W4-01. Critical properties of a generalized *XY* model with competing nematic-like couplings. *M. Zukovic*[1] and G. Kalagov[1] *1. Institute of Physics, P. J. Šafárik University, Košice, Slovakia*

W4-02. Magnetic Transitions in the Heusler Compounds $Fe_{3-x}Mn_xSi$. *T. Nonoyama*[1], M. Hiroi[2], I. Shigeta[1], R. Kato[1], H. Manaka[2] and N. Terada[2] *1. Department of Physics and Astronomy, Graduate School of Science and Engineering, Kagoshima University, Kagoshima, Japan; 2. Department of Electrical and Electronics Engineering, Graduate School of Science and Engineering, Kagoshima University, Kagoshima, Japan*

W4-03. Withdrawn

W4-04. Novel Quantum and Thermal Phase Transitions of Easy-Axis Triangular Antiferromagnets in a Transverse Field. *D. Yamamoto*[1], G. Marmorini[2], M. Tabata[1] and I. Danshita[3] *1. Department of Physics and Mathematics, Aoyama-Gakuin University, Sagamihara-shi, Kanagawa, Japan; 2. Research and Education Center for Natural Sciences, Keio University, Kanagawa, Japan; 3. Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Japan*

W4-05. Non-equilibrium phase transitions in magnetic systems. *A. Galda*[1,2] and V. Vinokur[2] *1. James Franck Institute, University of Chicago, Chicago, IL, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States*

W4-06. Magnetic and electrical properties of R_5Ir_3 (R = Tb, Er). *K. Ueda*[1] and T. Tsutaoka[1] *1. Graduate School of Education, Hiroshima University, Higashi-Hiroshima, Japan*

W4-07. Magnetic properties of $Li^{57}Fe_{0.01}Mn_{0.99}PO_4$ investigated by using external field Mössbauer spectroscopy. *H. Choi*[1] and C. Kim[1] *1. Department of Physics, Kookmin University, Seoul, The Republic of Korea*

W4-08. Magnetic study on inverse spinel compounds Co_2XO_4 (X = Ti, Sn) with partial substitution of Zn for Co. *H. Ohta*[1], S. Takada[1], G. Ueda[1], K. Yamagishi[1] and H. Aruga Katori[1] *1. Department of Applied Physics, Tokyo University of Agriculture and Technology, Koganei, Japan*

W4-09. Magnetic Property of Polymorphs $(Al_xFe_{2-x})GeO_5$. *H. Aruga Katori*[1] *1. Department of Applied Physics, Tokyo University of Agriculture and Technology, Koganei, Japan*

W4-10. Withdrawn

W4-11. Origin of Magnetocrystalline Anisotropy in Trigonal Magnetics with Zero Orbital Moment. *J. Kliava*[1], K. Seleznyova[2], M. Strugatsky[2], A. Drovosekov[3], S. Yagupov[2] and V. Zubov[4] *1. LOMA, Université de Bordeaux, Talence, France; 2. Physics and Technology Institute, Crimean Federal University, Simferopol, Russian Federation; 3. P.L. Kapitza Institute for Physical Problems, RAS, Moscow, Russian Federation; 4. Lomonosov Moscow State University, Moscow, Russian Federation*

FRIDAY MORNING 10:00 — SAN FRANCISCO BALLROOM

Session W5
MULTIFERROICS III (Poster Session)

Helen Walker, Chair
STFC, Didcot, United Kingdom

W5-01. Spin waves in multiferroic Ni_3TeO_6. *J. Lass*[1,2], C.R. Andersen[1], J.O. Birk[1], H.K. Leerberg[1], S. Birkemose[1], S. Toth[2], U. Stuhr[2], M. Bartoviak[2], C. Niedermayer[2], Z. Lu[3], R. Toft-Petersen[4], M. Retuerto[5] and K. Lefmann[1] *1. Niels Bohr Institute, University of Copenhagen, København Ø, Denmark; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. Helmholtz-Zentrum Berlin, Berlin, Germany; 4. Physics, Technical University of Denmark, Lyngby, Denmark; 5. Instituto de Catálisis y Petroleoquímica, Consejo Superior de Investigaciones Cientificas, Madrid, Spain*

W5-02. Effect of the Eu^{3+} ion Substitution at the Nd site of the $NdCrTiO_5$: Structural, Magnetic, Electrical And Electronic Structure Studies. *K. Gautam*[1], A. Ahad[2], K. Dey[1], S. Majid[2], S.K. Sharma[5], J. Coaquira[3], S. Francoual[4] and D. Shukla[1] *1. Material Science, UGC-DAE,CSR, Indore, India; 2. Physics, Aligarh Muslim University, Aligarh, ALIGARH, India; 3. Laboratory of Magnetic Materials, University of Brasilia, NFA, Brazil; 4. Photon Science, Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany; 5. Physics, Universidade Federal do Maranhão, Sao Luis, Brazil*

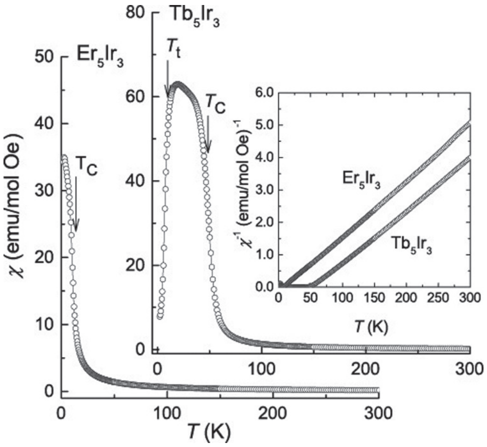
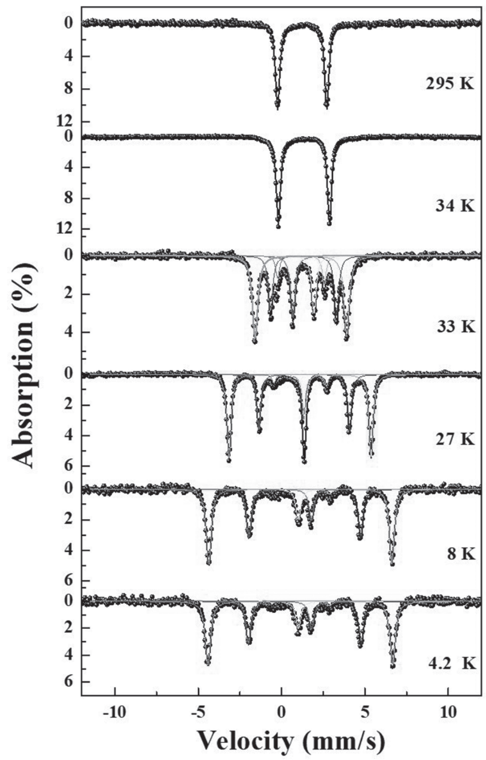


Fig.2 Magnetic susceptibility χ of R_5Ir_3 (R = Tb, Er) as a function of temperature.

W4-07. Magnetic properties of $Li^{57}Fe_{0.01}Mn_{0.99}PO_4$ investigated by using external field Mössbauer spectroscopy. *H. Choi*[1] and C. Kim[1] *1. Department of Physics, Kookmin University, Seoul, The Republic of Korea*

The $Li^{57}Fe_{0.01}Mn_{0.99}PO_4$ polycrystalline sample has been studied by x-ray diffraction (XRD), vibrating sample magnetometer(VSM), and Mössbauer spectroscopy. The crystal structure is found to be orthorhombic with space group *Pmnb*. The lattice constants are a_0=6.1009, b_0=10.4435, and c_0= 4.7427 Å. The magnetic properties of the sample were measured by using a VSM. The temperature dependences of ZFC and FC magnetizations at an applied field of 100 Oe. They show that magnetic Néel temperature (T_N) and spin-reorientation temperature (T_S) is 34 and 8 K, respectively. Mössbauer spectra of $Li^{57}Fe_{0.01}Mn_{0.99}PO_4$ have been taken at various temperatures ranging from 4.2 to 295 K. Magnetic hyperfine and quadrupole interaction in $Li^{57}Fe_{0.01}Mn_{0.99}PO_4$ at 4.2 K have been studied, yielding the following result; hyperfine field H_{hf} = 320.78 kOe, electric quadrupole splitting ΔE_Q = 2.81 mm/s, θ = 90°, ϕ = 0°, η = 0.75, and R = 1.2. Also, we were performed the Mössbuaer measurements with a high external field of 4.8 T. The value of magnetic hyperfine field (329.97 kOe) with external field of 4.8 T at 4.2 K was larger than that 320.78 kOe with zero magnetic field. While, the electric quadrupole splitting (2.62 mm/s) with external field 4.8 T at 4.2 K was smaller than that 2.81 mm/s with zero applied field. The abrupt increase in H_{hf} and magnetization was caused by orbital angular moment contribution from spin-orbit coupling.

Y. Deng, et al, Adv. Energy Mater. 7, 1601958 (2017).



Mössbauer spectra of $Li^{57}Fe_{0.01}Mn_{0.99}PO_4$ at various temperatures from 4.2 to 295 K

W4-08. Magnetic study on inverse spinel compounds Co_2XO_4 (X = Ti, Sn) with partial substitution of Zn for Co. *H. Ohta*[1], S. Takada[1], G. Ueda[1], K. Yamagishi[1] and H. Aruga Katori[1] *1. Department of Applied Physics, Tokyo University of Agriculture and Technology, Koganei, Japan*

Inverse spinels Co_2XO_4 (X = Ti, Sn) are known as compensated ferrimagnets with their ferrimagnetic transition temperature T_N = 48 K and 41 K for X = Ti and Sn, respectively[1-3]. In their ferrimagnetic state, a spin-glass-like behavior is also observed. Thus, these compounds are categorized as the semi spin glass[3,4]. Although the magnetic structure in the ordered state has been revealed, the reason why the moments show both collinear ordering and spin glass freezing is still unclear. In Co_2XO_4, Co ions occupy both the whole of the A site and a half of the B site, and X ions occupy the rest of the B site. Thus, the B site, also known as the pyrochlore lattice, is just half-filled with magnetic ions. In this situation, spins are distributed onto the pyrochlore lattice at perfectly random, and this may lead to the spin glass. To understand the origin of semi spin glass of Co_2XO_4 and physics of the half-filled pyrochlore lattice, we studied Co_2XO_4 by partially substituting Zn for Co. Here, Zn preferentially replaces the A site rather than the B site. From the analysis results of the powder X-ray diffraction measurements, we confirm that Co atoms on the A site are selectively replaced with Zn atoms in both cases of X. After Zn atoms fully occupy the A site, the Co atoms on the B site are replaced with Zn atoms. The magnetic measurement results show that T_N of both compounds decreases with the increase of the ratio of Zn to Co, and their magnetism changes from ferrimagnetism to spin glass when all the Co atoms on the A site are replaced with Zn atoms. These results indicate that the pyrochlore lattice which is half-filled with Co atoms shows spin glass due to its randomness, and semi spin glass of Co_2XO_4 originates from this nature of the half-filled pyrochlore lattice.

[1] S. Thota, V. Narang, S. Nayak, S. Sambasivam, B. C. Choi, T. Sarkar, M. S. Andersson, R. Mathieu, and M. S. Seehra, J. Phys.:Condends. Matter 27 166001 (2015). [2] S. Nayak, S. Thota, D. C. Joshi, M. Krautz, A. Waske, A. Behler, J. Eckert, T. Sarkar, M. S. Andersson, R. Mathieu, V. Narang, and M. S. Seehra, Phys. Rev. B 92, 214434 (2015). [3] J. Hubsch, and