

Seul-Ki Bac

skbac28@gmail.com

Education

- Feb. 2020 Ph. D. **Korea University**
Physics
Dissertation: Magneto-transport Study on the Crystalline Ferromagnetic Systems
Advisor: Sanghoon Lee
- Feb. 2013 B.A. **Korea University**
Major: Physics, Minor: Mathematics

Experience

- Mar. 2020 ~ Present **Postdoctoral Research Associate**
University of Notre Dame - Department of Physics, Badih Assaf
- Oct. 2019 ~ Feb. 2020 **Part-time Lecturer**
Korea University - General Physics Experiments II
- Mar. 2017 ~ Jul. 2019 **Staff Research Associate**
University of Notre Dame - Department of Physics, Jacek K. Furdyna
- Mar. 2015 ~ Feb. 2017 **Part-time Lecturer**
Korea University - General Physics Experiments I & II

Scientific Expertise

- Magnetotransport (Hall effects, magnetoresistance, ...)
- Magnetometer (Superconducting quantum interference device)
- Device fabrication (photolithography, chemical wet & dry etching, E-beam evaporate deposition, ...)
- Characterization (High-resolution X-ray diffraction, reciprocal space mapping)

Selected Publications

1. S.-H. Choi, S.-K. Bac, *et al.*, "Exchange bias in ferromagnetic bilayers with orthogonal anisotropies: the case of GaMnAsP/GaMnAs combination", *Scientific Reports* 9, 13061 (2019)
2. S. Dong, Y.-L. Wang, S.-K. Bac, *et al.*, "Programmable bias field observed in graded ferromagnetic semiconductor films with broken symmetry", *Physical Review Materials* 3, 074407 (2019)
3. P. Chongthanaphisut, S.-K. Bac, S. Choi, K.J. Lee, J. Chang, S. Choi, S. Lee, M. Nnaji, X. Liu, M. Dobrowolska, J.K. Furdyna, "Interlayer exchange coupling in ferromagnetic semiconductor trilayers with out-of-plane magnetic anisotropy", *Scientific Reports* 9, 4740 (2019)
4. S. Lee, S. Lee, S.-K. Bac, S. Choi, X. Liu, M. Dobrowolska, J.K. Furdyna, "Spin-orbit-induced effective magnetic field in GaMnAs ferromagnetic semiconductor", *IEEE Transaction on Magnetics* 55, 2400206 (2019)
5. S. Lee, K.J. Lee, S. Choi, S.-K. Bac, J. Chang, S. Choi, P. Chongthanaphisut, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Noncollinear magnetoresistance of trilayers consisting of two ferromagnetic GaMnAs layers and a nonmagnetic GaAs:Be spacer", *Journal of Crystal Growth* 512, 176 (2019)
6. K. Tivakornsasithorn, S. Lee, S.-K. Bac, S. Choi, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Interlayer exchange coupling between Fe and GaMnAs ferromagnetic semiconductor", *IEEE Transactions on Magnetics* 55, 1 (2019)
7. J. Chang, S. Choi, K.J. Lee, S.-K. Bac, S. Choi, P. Chongthanaphisut, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Effects of film thickness and annealing on the magnetic properties of GaMnAsP ferromagnetic semiconductor", *Journal of Crystal Growth* 512, 112 (2019)

8. X. Li, S.-K. Bac, S. Dong, X. Liu, S. Lee, S. Rouvimov, M. Dobrowolska, J.K. Furdyna, "Orthogonal interfacial exchange coupling in GaMnAsP/GaMnAs bilayers", *AIP Advances* 8, 56401 (2018)
9. K.J. Lee, S. Lee, S.-K. Bac, S. Choi, H. Lee, J. Chang, S. Choi, P. Chongthanaphisut, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Magnetization reversal in trilayer structures consisting of GaMnAs layers with opposite signs of anisotropic magnetoresistance", *Scientific Reports* 8, 2288 (2018)
10. K. Tivakomsasithorn, T. Yoo, H. Lee, S. Lee, S. Choi, S.-K. Bac, K.J. Lee, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Magnetization reversal and interlayer exchange coupling in ferromagnetic metal/semiconductor Fe/GaMnAs hybrid bilayers", *Scientific Reports* 8, 10570 (2018)
11. X. Liu, S.-K. Bac, P. Sapkota, C. Gorsak, X. Li, S. Dong, S. Lee, S. Ptasinska, J.K. Furdyna, M. Dobrowolska, "In situ annealing of $\text{III}_{1-x}\text{Mn}_x\text{V}$ ferromagnetic semiconductors", *Journal of Vacuum Science Technology B* 36, 02D102 (2018)
12. X. Liu, X. Li, S.-K. Bac, X. Zhang, S. Dong, S. Lee, M. Dobrowolska, J.K. Furdyna, "Ferromagnetic resonance and spin-wave resonances in GaMnAsP films", *AIP Advances* 8, 56402 (2018)
13. S.-K. Bac, H. Lee, S. Lee, S. Choi, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Effects on magnetic properties of GaMnAs induced by proximity of topological insulator Bi_2Se_3 ", *Journal of Electronic Materials* 47, 4308 (2018)
14. X. Li, X. Liu, S. Dong, C. Gorsak, J.K. Furdyna, M. Dobrowolska, S.-K. Bac, S. Lee, S. Rouvimov, "Dependence of ferromagnetic properties of phosphorus concentration in $\text{Ga}_{1-x}\text{Mn}_x\text{As}_{1-y}\text{P}_y$ ", *Journal of Vacuum Science Technology B* 36, 02D104, (2018)
15. S. Lee, S.-K. Bac, S. Choi, H. Lee, T. Yoo, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Non-volatile logic gates based on planar Hall effect in magnetic films with two in-plane easy axes", *Scientific Reports* 7, 1115 (2017)
16. S. Lee, T. Yoo, S.-K. Bac, S. Choi, H. Lee, S. Lee, X. Liu, J.K. Furdyna, M. Dobrowolska, "Manipulation of magnetization in GaMnAs films by spin-orbit-induced magnetic fields", *Current Applied Physics* 17, 801 (2017)
17. T. Yoo, A.R. Nasir, S.-K. Bac, S. Lee, S. Choi, S. Lee, X. Liu, J.K. Furdyna, "Magnetic properties of Ni films deposited on MBE grown Bi_2Se_3 layers", *AIP Advances* 7, 055819 (2017)
18. H. Lee, J. Chang, P. Chongthanaphisut, S. Lee, S. Choi, S.-K. Bac, A.R. Nasir, S. Lee, A. Pardo, S. Dong, X. Li, X. Liu, J.K. Furdyna, M. Dobrowolska, "Magnetic anisotropy of quaternary GaMnAsP ferromagnetic semiconductor", *AIP Advances* 7, 055809 (2017)
19. H. Lee, S. Lee, S. Choi, S.-K. Bac, S. Lee, X. Li, X. Liu, M. Dobrowolska, J.K. Furdyna, "Interlayer exchange coupling in MBE-grown GaMnAs-based multilayer systems", *Journal of Crystal Growth* 477, 188 (2017)
20. S. Lee, T. Yoo, S.K. Bac, S. Choi, H. Lee, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Field-free manipulation of magnetization alignments in a Fe/GaAs/GaMnAs multilayer by spin-orbit-induced magnetic fields", *Scientific Reports* 7, 10162 (2017)
21. A.R. Nasir, T. Yoo, S.-K. Bac, H. Lee, S. Lee, S. Choi, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Effect of underlying Bi_2Se_3 surface on magnetic properties of Ni films", *IEEE Transaction on Magnetics* 53, 6500204 (2017)
22. S. Lee, S. Choi, S.-K. Bac, K.J. Lee, J. Chang, S. Choi, P. Chongthanaphisut, S. Lee, X. Liu, M. Dobrowolska, J.K. Furdyna, "Determination of current-induced spin-orbit effective magnetic field in GaMnAs ferromagnetic semiconductor", *Applied Physics Letters* 111, 252401 (2017)
23. S. Lee, S. Choi, S.-K. Bac, H. Lee, T. Yoo, S. Lee, X. Liu, J.K. Furdyna, "Temperature-induced transition of magnetic anisotropy between in-plane and out-of-plane directions in GaMnAs films", *Solid State Communications* 244, 7 (2016)
24. S.-K. Bac, H. Lee, S. Lee, S. Choi, T. Yoo, S. Lee, X. Liu, J.K. Furdyna, "Magnetic anisotropy of crystalline Fe films grown on (001) GaAs substrates using Ge buffer layers", *AIP Advances* 6, 055806 (2016)
25. S. Choi, T. Yoo, S.-K. Bac, H. Lee, S. Lee, S. Lee, X. Liu, J.K. Furdyna, "Angular dependence of tunneling magnetoresistance in hybrid Fe/GaAlAs/GaMnAs magnetic tunnel junctions", *IEEE Transaction on Magnetics* 52, 2400204 (2016)
26. S.-K. Bac, H. Lee, S. Lee, S. Choi, T. Yoo, S. Lee, X. Liu, J.K. Furdyna, "Thickness dependence of uniaxial anisotropy fields in GaMnAs films", *Applied Physics Express* 8, 033201 (2015)
27. S.-K. Bac, H. Lee, S. Lee, S. Choi, T. Yoo, S. Lee, X. Liu, J.K. Furdyna, "Observation of uniaxial anisotropy along the [100] direction in crystalline Fe film", *Science Reports* 5, 17761 (2015)

28. H. Lee, S.-K. Bac, S. Lee, S. Choi, T. Yoo, S. Lee, X. Liu, J.K. Furdyna, "Experimental determination of next-nearest-neighbor interlayer exchange coupling in ferromagnetic GaMnAs/GaAs:Be multilayers", *Applied Physics Letters* 107, 192403 (2015)