SANGWON OH

PRINCIPAL RESEARCH SCIENTIST

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SUMMARY

- Studying diamond-based quantum sensors at KRISS
- Developed novel approaches (encoding and reconstruction methods) for fast MRI data acquisition by non-linear magnetic field gradients
- Visualized complex fluids, particle laden Newtonian and non-Newtonian fluids, and sedimentation processes using MRI and found compaction of jammed plug.
- Investigated Fe based and high T_C superconductors using nuclear magnetic resonance (NMR) and found novel behaviors including microscopic coexistence of spin density wave and superconductivity.

EDUCATION

- Aug. 2007 - Jun. 2013 : PhD in Physics
  - Thesis: *Nuclear Magnetic Resonance study on the pnictide superconductors in high magnetic fields*, Northwestern University(Advisor : William P. Halperin).
- Mar. 2000 - Feb. 2002 : MS in Physics from Seoul National University in Korea.
- Mar. 1996 - Feb. 2000 : BS in Physics from Seoul National University in Korea.

PROFESSIONAL EXPERIENCE

- Apr. 2018 - Current : Principal Research Scientist at KRISS
- Sep. 2016 - Mar.2018 : Senior Research Scientist at KRISS
- Apr. 2015 - Aug. 2016 : Post-doctoral Associate in Radiology Department at Yale University
- Jul. 2013 - Mar. 2015 : Post-doctoral Scientist at Schlumberger Doll Research in USA
- Aug. 2003 - Jul. 2007 : Process Engineer at Hynix Semiconductor Inc. in Korea.

Publication List

- *Quantum diamond microscopy with optimized magnetic field sensitivity and sub-ms temporal resolution*, **Sangwon Oh**, Seong-Joo Lee, Jeong Hyun Shim, Nam Woong Song, and Truong Thi Hien, J. Appl. Phys. *to be published* (2023)
- *Decoherence of nitrogen-vacancy spin ensembles in a nitrogen electron-nuclear spin bath in diamond*, Huijin Park, Junghyun Lee, Sangwook Han, **Sangwon Oh**, and Hosung Seo Npj Quantum Inf. **8**, 95 (2022)
- *Multiplexed Sensing of Magnetic Field and Temperature in Real Time Using a Nitrogen-Vacancy Spin Ensemble in Diamond*, Jeong Hyun Shim, Seong-Joo Lee, Santosh Ghimire, Ju Il Hwang, Kwang-Geol Lee, Kiwoong Kim, Matthew J. Turner, Connor A. Hart, Ronald L. Walsworth, **Sangwon Oh** Phys. Rev. Appl. **17**,014009 (2022)

- *Organic Reaction Monitoring of a Glycine Derivative Using Signal Amplification by Reversible Exchange-Hyperpolarized Benchtop Nuclear Magnetic Resonance Spectroscopy*, Heelin Chae, Sein Min, Hye Jin Jeong, Sung Keon Namgoong, **Sangwon Oh**, Kiwoong Kim, Keunhong Jeong Anal. Chem, **92**, 10902 (2020)
- *Hyperpolarization of nitrile compounds using signal amplification by reversible exchange*, Sarah Kim, Sein Min, Heelim Chae, Hye Jin Jeong, Sung Keon Namgoong, **Sangwon Oh**, Keunhong Jeong Molecules, **25**, 3347 (2020)
- *Dynamic nuclear polarisation of liquids at one microtesla using circularly polarised RF with application to millimetre resolution MRI*, Ingo Hilschenz, **Sangwon Oh**, Seong-Joo Lee, Kwon Kyu Yu, Kiwoong Kim, Jeong Hyun Shim J. Mag. Res., **305**, 138 (2019)
- *Overhauser proton spin-echo magnetometer for magnetic fields below 1 ?T*, Seong-Joo Lee, Jeong Hyun Shim, Kwon Kyu Yu, Seong-min Hwang, **Sangwon Oh**, Ingo Hilschenz, Kiwoong Kim Metrologia, **56**, 045011 (2019)
- *Toward a magnetic resonance electrical impedance tomography in ultra-low field*, Seong-Joo Lee, Jeong Hyun Shim, Kwon Kyu Yu, Seong-min Hwang, **Sangwon Oh**, Ingo Hilschenz, Kiwoong Kim App. Phys. Lett., **112**, 153703 (2018)
- *3D MRI with non-linear gradient filed, 3D O-Space*, **Sangwon Oh**, Gigi Galiana, Dana Peters, R. Todd Constable, Proceeding of the 24^{th} Annual Meeting of ISMRM, Singapore (2016)
- *Absolute phase effects on CPMG-type pulse sequences*, S. Mandal, **Sangwon Oh**, M. Hurilimann, J. Magn. Reson. **261** 121 (2015)
- *Pressure driven suspension flow near jamming*, **Sangwon Oh**, Yi-qiao Song, Dmitry I. Garagash, Brice Lecampion, Jean Desroches, Phys. Rev. Lett. **114**, 088301 (2015)
- *Enhanced self-diffusion of adsorbed methanol in silica aerogel*, Jengseop A. Lee, A. M. Mounce, **Sangwon Oh**, A. M. Zimmerman, W. P. Halperin, Phys. Rev. B **90**, 174501 (2014)
- *Absence of static loop-xurrent magnetism at the apical oxygen site in* $HgBa_2CuO_{4+\delta}$ from NMR, A.M. Mounce, **Sangwon Oh**, W. P. Halperin, A.P. Reyes, P.L. Kuhns, M. Chan, J. Li, D. Xia, X. Zhao, M. Greven, Phys. Rev. Lett. **111**, 187003 (2013)
- *Microscopic coexistence of a two-component incommensurate spin density wave with superconductivity in underdoped* $NaFe_{0.983}Co_{0.017}As$, **Sangwon Oh**, A.M. Mounce, Jeongseop A. Lee, W. P. Halperin, C.L. Zhang, S. Carr, P. Dai, A. P. Reyes, P. L. Kuhns Phys. Rev. B **88**, 134518 (2013)
- *Evidence of unconventional low-frequency dynamics in the normal phase of* $Ba(Fe_{1-x}Rh_x)_2As_2$ *iron-based supercondutors*, L. Bossoni, P. Carretta, W. P. Halperin, **S. Oh**, A. Reyes, P. Kuhns, Phys. Rev. B **88**, 100503(R) (2013)
- *Spin-pairing and penetration depth measurements from nuclear magnetic resonance in* $NaFe_{0.975}Co_{0.025}As$, **Sangwon Oh**, A.M. Mounce, J. Lee, W. P. Halperin, C.L. Zhang, S. Carr, P. Dai, Phys. Rev. B, **87** 174517 (2013)
- *Magnetic field dependence of spin-lattice relaxation in the* $s_{\pm}$ *state of* $Ba_{0.67}K_{0.33}Fe_2As_2$, **Sangwon Oh**, A.M. Mounce, W. P. Halperin, C.L. Zhang, P. Dai, A. P. Reyes, P.L. Kuhns, Phys. Rev. B, **85**, 174508 (2012)
- *Nuclear magnetic resonance studies of vortices in high temperature superconductors*, A.M. Mounce **S. Oh**, W. P. Halperin, Frontiers of Physics **6**, 450 (2011)

- *^{75}As NMR of $Ba(Fe_{0.93}Co_{0.07})_2As_2$ in high magnetic field*, **Sangwon Oh**, A.M. Mounce, S. Mukhopadhyay, W. P. Halperin, A.B. Vorontsov, S.L. Bud'ko, P.C. Canfield, Y. Furukawa, A. P. Reyes, P.L. Kuhns, Phys. Rev. B, **83**, 214501 (2011)
- *Spin density wave near the vortex cores in the high temperature superconductor $Bi_2Sr_2CaCu_2O_{8+y}$*, A.M. Mounce, **S. Oh**, S. Mukhopadhyay, W. P. Halperin, A. P. Reyes, P.L. Kuhns, K. Fujita, M. Ishikado, S. Uchida, Phys. Rev. Lett., **106**, 057003 (2011)
- *Charge induced vortex lattice instability*, A.M. Mounce, **S. Oh**, S. Mukhopadhyay, W. P. Halperin, A. P. Reyes, P.L. Kuhns, K. Fujita, M. Ishikado, S. Uchida, Nature Physics **7**, 125 (2011)
- *Magnetic impurities in the pnictide superconductor $Ba_{1-x}K_xFe_2As_2$*, S. Mukhopadhyay, **Sangwon Oh**, A.M. Mounce, M. Lee, W. P. Halperin, N. Ni, S.L. Bud'ko, P.C. Canfield, A. P. Reyes, P.L. Kuhns, New J. Phys. **11**, 055050 (2009)