

# LEE, Shyh-Yuan

## 1. Present Position and Address

Professor of Physics, Indiana University  
Department of Physics, SW117, Indiana University, Bloomington, IN 47405  
Tel: (812)855-2899 , e-mail: shylee@indiana.edu FAX: (812)855-6645

## 2. Education

- (a) National Taiwan University (1962-1966), B.S. in Physics
- (b) S.U.N.Y. Stony Brook (1968-1972), M.A. and Ph.D. in Physics

## 3. Honour

- (a) Humboldt Senior Research Award 2006
- (b) Former Graduate students:
  - Dr. Mei Bai – Outstanding thesis award (1999)
  - Dr. Haixin Huang – Faraday Cup award in instrumentation (2006)

## 4. Experience

- (a) University of Heidelberg and Max Planck Institute, Germany (1972-1974)
- (b) National Central University, Chung-Li, Taiwan (1974-1976)
- (c) University of Paris, Orsay (1976-1977)
- (d) University of Washington, Seattle (1977-1978)
- (e) S.U.N.Y. Stony Brook (1978-1984)
- (f) Academia Sinica, Nankang, Taipei (1982-1983).
- (g) Brookhaven National Laboratory, (1984-1990)
- (h) Indiana University, Bloomington (1990-present)

## 5. Services

- (a) Divisional Associate Editor, PRL (July 1, 2007 - June 30, 2010).
- (b) Chair of Education and Outreach Committee for the Division of Beam Physics, American Physics Society, 2005-2007. Chair of the Physics Teachers' Day at the PAC2007 in Albuquerque, NM, June 27, 2007.
- (c) The IEEE particle accelerator conference, program committee:1989, 1995, 1997, 2005, 2007.
- (d) Scientific Advisory Board for the European Particle Accelerator Conference 1996; 1998; 2000; 2002; 2004, 2006, 2008.
- (e) Member of the APS Wilson Prize Committee (2002-2004)
- (f) Chair of the 2003 USPAS prize committee (2003)

- (g) Director of the US Particle Accelerator School (1998-2001)
- (h) Member of the Science and technology steering committee, Brookhaven Science Associate, BNL (2003-); Member of the Program Advisory Committee, RHIC (2003-)
- (i) Chair, Machine Advisory Committee, (SRRC, Taiwan Light Source, 2000-2002); member of the External Review Committee (2004-)
- (j) A member of the Executive Committee for the Division of Physics of Beams (1998-2001).
- (k) APS representative of the nomination committee to the Division of Physics of Beams (1997-1998).
- (l) The International Committee for Future Accelerator (member of beam dynamics panel, 1994–1998) ; One of three editors of the ICFA beam dynamics newsletter published three times a year (1991-1998).

## 6. Major contributions in accelerator physics

- Proposed and designed the RHIC lattice with antisymmetric insertions (1985-1990). This lattice was accepted by the International Review Committee in 1985. The RHIC is essentially constructed based on this lattice.
- Spoke person for systematic experiments on nonlinear beam dynamics at the IUCF Cooler Ring (1990-1996). These studies provide detailed understanding of parametric and coupling resonances and the stochasticity for particle beams in accelerators. These results have been applied to understand resonances in space charge dominated beams, beam dynamics in quasi-isochronous storage rings, and serves as the fundamental principle for beam manipulations. We have introduced and studied the independent component analysis (ICA) data analysis to beam measurements and modeling since 2005.
- Uncover snake resonances (odd-order 1986, even-order 1993). One of spoke persons in the AGS partial snake experiment E880 (1992-2000). Verify the feasibility of using partial snake to overcome imperfection resonances. Proposed rf dipole modulation method to overcome intrinsic spin resonances (Dr. Mei Bai, a Ph.D. student, received outstanding DPB Ph.D. thesis award).
- Carry out analysis for the minimum emittance Triple-Bend Achromat (TBA) lattice. Uncover a necessary condition theorem for a minimum emittance of TBA lattice is that length of the middle dipole in the TBA must be  $3^{1/3}$  times longer than that of the outer dipoles in thin lens approximation. In 2006, proposed the concept of quadruple-bend achromat (QBA) lattice, which is superior to double-bend achromat (DBA) lattice for the medium energy (2-4 GeV) high brightness storage rings.
- Carried out space charge analysis for high intensity accelerators, uncovered the main source of emittance growth mechanisms for the Fermilab Booster (PRSTAB 9, 014202, 2006), and found simple scaling laws and fundamental limit of the non-scaling FFAG accelerators (PRL 97, 104801, 2006).

- Introduce a gradient damping wiggler for varying compaction factor. This can provide an easy design of isochronous storage ring for inverse Compton scattering. Introduce diffraction grating device to produce coherent THz radiation.

### Publications in Books

- S.Y. Lee, *Spin Dynamics and Snakes in Synchrotrons*, (World Scientific Pub. Co., Singapore, 1997); 2nd edition (2005).
- S.Y. Lee, *Accelerator Physics*, (World Scientific Pub. Co., Singapore, 1999)
- S.Y. Lee, ed. *Space Charge Dominated Beams and Applications of High Brightness Beams*, AIP Proceedings No. 377 (1996)
- S.I. Kurokawa, S.Y. Lee, E. Perevedentsev, and S. Turner, eds., *Beam Measurement*, World Scientific, Singapore, 1998).
- S.I. Kurokawa, S.Y. Lee, J. Miles, and E. Perevedentsev, eds., HIGH QUALITY BEAMS: Joint US-CERN-JAPAN-RUSSIA Accelerator School AIP Conference Proceedings **592**, (AIP, New York, 2001).

### Publications in Refereed Journals

1. Kuo, T.T.S., Lee, S.Y., Ratcliff, K.F. *A folded-diagram expansion of model-space effective Hamiltonian*. Nucl. Phys. **A176**, 65-88 (1971).
2. Hoffman, H.M., Lee, S.Y., Richert, J., Weidenmuller, H.A., Schucan, T.H. *A non-perturbative scheme for the calculation of the effective interaction in nuclei*. Phys. Lett. **45B**, 421-424 (1973).
3. Hoffman, H.M., Lee, S.Y., Richert, J., Weidenmuller, H.A., Schucan, T.H. *Nonperturbative schemes for the effective interaction in nuclei*. Ann. of Phys. **85**, 410-437 (1974).
4. Hufner, J., Lee, S.Y., Weidenmuller, H.A. *Strangeness analogue states and the spectrum of  $^{12}_{\Lambda}\text{C}$* . Phys. Lett. **49B**, 409-411 (1974).
5. Hufner, J., Lee, S.Y., Weidenmuller, H.A. *The formation of hypernuclei by  $K^-$  capture*. Nucl. Phys. **A234**, 429-444 (1974).
6. Lee, S.Y. *A review on the nuclear effective interactions*. Nat. Sci. Council Monthly **IV**, 2418-2430 (1976).
7. Lee, K.C., Lee, S.Y., Chern, D.C., Fu, C.C. *The energy dependence of the nuclear effective interaction*. Chin. J. Phys. (Taiwan) **14**, 3, 6-14 (1976).
8. Lee, S.Y. *The  $K^-$  nucleus optical potentials*. Chin. J. Phys. (Taiwan) **14**, 112-115 (1976).

9. Auerbach, N., Nguyen Van Giai, Lee, S.Y. *The  $\Lambda$  escape width of excited hypernuclear states.* Phys. Lett. **68B**, 225–228 (1977).
10. Takigawa, N., Lee, S.Y. *Nuclear glory effect and  $\alpha$ - $^{40}\text{Ca}$  scattering.* Nucl. Phys. **A292**, 173–189 (1977).
11. Lee, S.Y., Takigawa, N., Marty, C. *A semiclassical study of optical potentials: potential resonances.* Nucl. Phys. **A308**, 161–188 (1978).
12. Lee, S.Y. Takigawa, N. *A wave propagation matrix method in semiclassical theory.* Nucl. Phys. **A308**, 189–209 (1978).
13. Lee, S.Y. *Semiclassical analysis of the scattering of  $^{16}\text{O}$  by  $^{28}\text{Si}$ .* Nucl. Phys. **A311**, 518–535 (1978).
14. Takigawa, N., Lee, S.Y., Marty, C. *Long life potential resonances in  $^{16}\text{O} - ^{12}\text{C}$  scattering from an  $l$ -dependent absorptive potential.* Phys. Lett. **76B**, 187–191 (1978).
15. Lee, S.Y. *Backward glory in heavy ion scattering. Les Houches Summer School.* Ed. M. Rho, G. Ripka North Holland Co., Session XXX, 56 (1977).
16. Lee, S.Y., Suzuki, K. *The effective interaction of two nucleons in the  $s$ - $d$  shell.* Phys. Lett. **91B**, 173–176 (1980).
17. Suzuki, K., Lee, S.Y. *Convergent theory for effective interaction in nuclei.* Progr. Theoretical Phys. **64**, 2091–2106 (1980).
18. Kuo, T.T.S., Osterfeld, F., Lee, S.Y. *Theory of energy-independent nuclear optical model potentials.* Phys. Rev. Lett **45**, 786–790 (1980).
19. Lee, S.Y., Chu, Y.H., Kuo, T.T.S. *Molecular resonance effects in heavy ion excitation functions.* Phys. Rev. **C24**, 1502–1511 (1981).
20. Chu, Y.H., Lee, S.Y. *The form factors in (HI, HI') direct reactions.* Nucl. Phys. **A369**, 514–532 (1981).
21. Lee, S.Y., Braun-Munzinger, P. *Statistical aspects of isotope production in heavy ion reactions.* Phys. Rev. **C24**, 1343–1345 (1981).
22. Lee, S.Y., Osterfeld, F., Tam, K., Kuo, T.T.S. *General properties of energy independent nuclear optical model potentials.* Phys. Rev. **C24**, 329–334 (1981).
23. Geyer, H.B., Lee, S.Y. *Microscopic structure of an interacting boson model in terms of the Dyson boson mapping.* Phys. Rev. **C26**, 642–651 (1982).
24. Lee, S.Y., Wilschut, H., Ledoux, R. *Intermediate structure of  $^{12}\text{C} + ^{12}\text{C}$  system.* Phys. Rev. **C25**, 2844–2847 (1982).

25. Lee, S.Y., Takigawa, N. Quantum tunneling in multidimensional systems. Phys. Rev. **C28**, 1123–1135 (1983).
26. Lin, L., Lee, S.Y., Tsai, S.F., Chen, H.T. Can a  $\beta$ -vibration band exist in  $^{168}\text{Er}$ . Letter to the Editor, J. Phys. G; Nucl. Phys. **9**, L223–L227 (1983).
27. Lee, S.Y., Tsai, S.F., Chen, H.T., Lin, L. Deformed bosons in the Nilsson scheme. Phys. Rev. **C28**, 955–957 (1983).
28. Chu, Y.H., Kuo, T.T.S., Lee, S.Y. *Second order processes in heavy ion collisions with application to  $^{12}\text{C} + ^{12}\text{C}$  reactions*. Phys. Rev. **C29**, 811–827 (1984).
29. Lee, S.Y., McGrath, R.L., Dean, D.R. *Diffractive, diffusive, and statistical aspects of deep inelastic heavy-ion collisions*. Phys. Rev. **C30**, 887–895 (1984).
30. Lee, S.Y. *Comment on the transfer channel correction to the heavy ion sub-barrier fusion cross section*. Phys. Rev. **C29**, 1932–1933 (1984).
31. Lee, S.Y., Tepikian, S. *Resonance due to a local spin rotator in high-energy accelerators*. Phys. Rev. Lett. **56**, 1635–1638 (1986).
32. Tepikian, S., Lee, S.Y., Courant, E.D. *On multipole spin resonances for the polarized proton*. Particle Accelerators **20**, 1–22 (1986).
33. Wei, J., Lee, S.Y., Ruggiero, A.G. *Longitudinal space charge effect in multiturn injection on AGS booster*. Particle Accelerators **24**, 211 (1988).
34. Khiari, F.Z., *et al.*, *Acceleration of polarized protons to 22 GeV/c and the measurement of spin-spin effects in  $p_{\uparrow} + p_{\uparrow} \rightarrow p + p$* . Phys. Rev. **D39** 45–85 (1989).
35. Krisch, A.D., *et al.*, *First test of the Siberian snake magnet arrangement to overcome depolarizing resonances in a circular accelerator*. Phys. Rev. Lett. **63**, 1137–1140 (1989).
36. Goodwin, J.E., *et al.*, *Overcoming Intrinsic and Synchrotron Depolarizing Resonances with a Siberian Snake*. Phys. Rev. Lett. **64**, 2779–2782 (1990).
37. Lee, S.Y., Courant, E.D. *Tolerance of the imperfections in high-energy circular accelerators for polarized protons*. Phys. Rev. **D41**, 292–302 (1990).
38. Lee, S.Y., *A multipole expansion for the Field of Vacuum Chamber Eddy Currents*, Nucl. Inst. and Method. **A300**, 151 (1990).
39. Dell, G.F., Lee, S.Y., Parzen, G. *Studies on the chromaticity correction and dynamic aperture of the AGS Booster*. Particle Accelerators, **27**, 227–232 (1990).
40. Wei, J., Lee, S.Y. *Microwave instability near transition energy*. Particle Accelerators, **28**, 77–82 (1990).

41. Lee, S.Y., Tran, P., Weng, W.T. *Landau damping due to tune spreads in betatron amplitude and momentum*. Particle Accelerators, **28**, 71-76(1990).
42. Lee, S.Y., *Snakes and Spin Rotators*, Nucl. Inst. and Methods, **A306**, 1, (1991).
43. Lee, S.Y., L.G. Ratner, *Feasibility of a Polarized Deuteron Beam in the AGS and RHIC*, Nucl. Inst. and Methods, **A306**, 51, 1991.
44. M.G. Minty, *et al.*, *Spin Tune Shift due to Type III Snake in the Electron Cooling System*, Phys. Rev. **D44**, R1361 (1991).
45. S.Y. Lee *et al.*, *Experimental Determination of a Nonlinear Hamiltonian in a Synchrotron*, Phys. Rev. Lett., **67**, 3768 (1991).
46. G. Bunce *et al.*, *Polarized Protons at RHIC*, Particle World, **3**, No.1, 1 (1992).
47. D.D. Caussyn *et al.*, *Experimental studies of Nonlinear Beam Dynamics*, Phys. Rev. **A46**, 7942 (1992).
48. V.A. Anferov, *et al.*, Phys. Rev. **A46**, R7383 (1992)
49. M. Ellison *et al.*, *Driven Response of a Beam*, Phys. Rev. Lett. **70**, 591 (1993).
50. S.Y. Lee, K.Y. Ng, and D. Trbojevic, *Minimizing dispersion in flexible momentum compaction lattices*, Phys. Rev. **E48**, 3040 (1993).
51. S.Y. Lee, *Spin Depolarization Mechanisms due to Overlapping Spin Resonances in Synchrotrons*, Phys. Rev. **E47**, 3631 (1993).
52. M.G. Minty, S.Y. Lee, *Effect of a Type-3 snake and the  $G\gamma = 2$  Imperfection resonance on the Spin Motion in a Proton Synchrotron*, Particle Accelerators, **41**, 71 (1993).
53. R. Baiod, *et al.*, Phys. Rev. Lett. **70**, 2557 (1993)
54. M. Syphers, *et al.*, *Experimental studies of Synchro-betatron coupling induced by dipole modulation*, Phys. Rev. Lett. **71**, 719 (1993).
55. D. Li *et al.*, *Experimental measurement of resonance islands induced by the rf voltage modulation*, Phys. Rev. **E48**, R1638 (1993).
56. H. Huang *et al.*, *Experimental determination of Hamiltonian for synchrotron motion with rf phase modulation*, Phys. Rev. **E48**, 4678 (1993).
57. R.A. Phelps *et al.*, *Adiabatic partial Siberian Snake turn-on with no beam depolarization*, Phys. Rev. Lett. **72**, 1479 (1994).
58. Y. Wang, *et al.*, *Effects of the synchro-betatron coupling induced by Dipole Modulations*, Phys. Rev. **E49**, 1610 (1994).

59. J.Y. Liu *et al.*, *Determination of the Linear Coupling Resonance Strength using 2D invariant Tori*, Phys. Rev. **E49**, 2347 (1994).
60. A. Gerasimov and S.Y. Lee, *Random driving of nonlinear oscillators*, Phys. Rev. **E49**, 3881 (1994).
61. Y. Wang, *et al.*, *Effects of tune modulation on particles trapped in 1D resonance islands*, Phys. Rev. **E49**, 5697 (1994).
62. S.Y. Lee, *Single particle dynamics at synchro-betatron coupling resonances*, Phys. Rev. **E49**, 5706 (1994)
63. S.Y. Lee *et al.*, *Parametric resonances of double rf system*, Phys. Rev. **E49**, 5717 (1994).
64. B.B. Blinov, *et al.*, *First test of a partial snake during polarized beam acceleration*, Phys. Rev. Lett. **73**, 1621 (1994).
65. D.D. Caussyn *et al.*, *Negative Resistance Instability due to nonlinear damping in synchrotrons*, Phys. Rev. Lett. **73**, 2696 (1994).
66. D.D. Caussyn *et al.*, *Spin Flipping a stored polarized proton beam* Phys. Rev. Lett. **73**, 2857 (1994).
67. M. Ellison *et al.*, *Experimental measurements of Invariant surface near a 2D nonlinear resonance*, Phys. Rev. **E50**, 4051 (1994)
68. H. Huang *et al.*, *Preservation of polarization with a partial snake*, Phys. Rev. Lett. **73**, 2982 (1994).
69. J.Y. Liu *et al.*, *Bifurcation of Resonance islands and Landau damping in the double rf system*, Phys. Rev. E **50**, R3349 (1994).
70. S.Y. Lee, A. Riabkov, *On the Hamiltonian of an intense charge particle beam in periodic solenoidal fields*, Phys. Rev. E **51**, 1609 (1995).
71. S.Y. Lee, *Nonlinear Beam Dynamics Experiments at IUCF Cooler Ring, Accelerator physics at the SSC*, AIP Proceedings No. 326, edited by Y. Yan and M. Syphers, p.13 (1995).
72. A. Riabko *et al.*, *Hamiltonian formalism for the halo formation in a space charge dominated beam*, Phys. Rev. E **51**, 3529, (1995).
73. J.Y. Liu *et al.*, *Analytic solution of particle motion in a double rf system*, Particle Accelerators. **49**, 221-251 (1995).
74. D.D. Caussyn *et al.*, *Effects of Nonlinear Damping force in synchrotrons with electron cooling*, Phys. Rev. E **51**, 4947 (1995).

75. C. Ohmori *et al.*, *Observation of a second order spin depolarizing resonance*, Phys. Rev. Lett. **75**, 1931 (1995).
76. D. Li *et al.*, *Effects of rf voltage modulation on particle motion*, Nucl. Inst. Methods **A 364**, 205 (1995).
77. J. Budnick *et al.*, *Design, fabrication, and experimental test of a multi-purpose Panofsky magnet*, Nucl. Inst. and Methods, **A368**, 572 (1996).
78. S.Y. Lee *et al.*, *Effects of magnetized cooling on Hopf bifurcation*, Phys. Rev. E **53** 1287 (1996).
79. L.A. Alexeeva *et al.*, *Crossing Intrinsic resonances by varying a partial snake*, Phys. Rev. Lett., **76**, 2714 (1996).
80. S.Y. Lee and M. Berglund, *Overlapping synchrotron sideband resonances*, Phys. Rev. E**54**, 806 (1996)
81. A. Riabko *et al.*, *Particle dynamics in quasi-isochronous storage rings*, Phys. Rev. E**54**, 815 (1996).
82. S.Y. Lee, *Emittance optimization for the three and multiple bend achromats*, Phys. Rev. E**54**, 1940 (1996).
83. D. Jeon *et al.*, *The role of parametric resonances in global chaos*, Phys. Rev. E**54**, 4192 (1996)
84. C.M. Chu *et al.*, *A method of detecting coherent synchrotron modes*, Nucl. Inst. and Methods **A 381**, 215 (1996)
85. D.A. Crandell *et al.*, *Spin flipping through an intrinsic depolarizing resonance by strengthening it*, Phys. Rev. Lett. **77**, 1763 (1996)
86. M. Bai *et al.*, *Stochastic beam dynamics in quasi-isochronous dynamical system*, Phys. Rev. E**55**, 3493 (1997).
87. R.A. Phelps, *et al.*, *First Observation of a Snake Depolarizing Resonance*, Phys. Rev. Lett. **78**, 2772 (1997).
88. S.Y. Lee, and K.Y. Ng, *Particle Dynamics in barrier rf systems*, Phys. Rev. E**55**, 5992 (1997).
89. S.Y. Lee and A. Riabko, *The envelope dynamics of intense charge particle beams in solenoidal focusing channels*, the Chinese Journal of Physics, **35**, 387 (1997)
90. M. Bai *et al.*, *Experimental Test of Coherent Betatron Resonance Excitations*, Phys. Rev. E**56**, 6002 (1997)
91. D. Jeon, *et al.*, *A mechanism of anomalous diffusion in beams*, Phys. Rev. Lett. **80**, 2314 (1998)

92. M. Bai *et al.*, *Overcoming intrinsic spin resonances with an rf dipole*, Phys. Rev. Lett. **80**, 4673 (1998).
93. S.Y. Lee, H. Okamoto, *Space charge dominated beams in synchrotrons*, Phys. Rev. Lett. **80**, 5133 (1998)
94. C.M. Chu *et al.*, *Unexpectedly wide rf-induced synchrotron sideband depolarizing resonances*, Phys. Rev. E **58**, 4973 (1998).
95. B.B. Blinov *et al.*, *Spin Flipping in the Presence of a Full Siberian Snake*, Phys. Rev. Lett. **81**, 2906 (1998).
96. C.M. Chu *et al.*, *Diffusion Mechanism with rf phase modulation*, Phys Rev. E **60**, 6051 (1999)
97. K. Krueger *et al.*, *Large analyzing power in inclusive  $\pi^\pm$  production in high  $x_F$  with a 22-GeV/c polarized proton beam*, Phys. Lett. **B 459**, 412 (1999).
98. M. Bai *et al.*, *Observation of the hybrid spin resonance*, Phys. Rev. Lett. **84**, 1184 (2000)
99. K.M. Fung *et al.*, *Bunch Compression manipulations*, Phys. Rev. Special Topics: Accelerators and Beams, **3**, 100101 (2000).
100. M.H. Wang, and S.Y. Lee, *RF Voltage Modulation and Coupled Bunch Instabilities*, Journal of Applied Physics, **92**, 555 (2002).
101. W. Guo and S.Y. Lee, *Quadrupole-mode transfer function and the nonlinear Mathieu instability*, Phys. Rev. E **65**, 066505 (2002)
102. C.E. Algoter *et al.*, *Measurement of analyzing powers of  $\pi^+$  and  $\pi^-$  produced on a hydrogen and a carbon target with a 22-GeV/c incident polarized proton beam*, Phys. Rev. D **65**, 092008 (2002).
103. Nader Al Harbi and S.Y. Lee, *Design of a compact medical synchrotron*, Review of Scientific Instruments, **74**, 2540 (2003).
104. S. Cousineau, S.Y. Lee, J.A. Holmes, V. Danilov, A. Fedotov, *Envelope and Particle Instabilities of Space Charge Dominated Beams in Synchrotrons*, Phys. Rev. Special Topics: Accelerators and Beams, **6**, 034205 (2003).
105. H. Hahn, *et al.*, *The RHIC design overview*, Nucl. Instr. and Meth. **A 499**, 245 (2003).
106. I. Alekseev, *et al.*, *Polarized proton collider at RHIC*, Nucl. Instr. and Meth. **A 499**, 392 (2003).
107. V. Ranjbar, S.Y. Lee, H. Huang, A. U. Luccio, W. W. MacKay, V. Ptitsyn, T. Roser, S. Tepikian, *Observation of Higher Order Snake Resonances in Polarized Proton Acceleration in RHIC*, Physical Review Letters, **91**, 034801 (2003).

108. P. Chou, M. H. Wang, and S.Y. Lee, *Effect of the rf cavity cooling-water temperature on electron beams with rf voltage modulation*, Physical Review Special Topics in Accelerators and Beams **6**, 052803 (2003).
109. S.Y. Lee Y. Zhang, and K.Y. Ng, *Beam damping in optical stochastic cooling*, Fermilab Technote FN-0718 (2003); Nuclear Instru and Methods, **A532**, 340 (2004)
110. V. Ranjbar, *et. al.*, *Spin Coupling Resonance and Suppression in the AGS*, Physical Review Special Topics in Accelerators and Beams, **7**, 051001 (2004).
111. Xiaobiao Huang, S.Y. Lee, Eric Prebys and Ray Tomlin, *Application of Independent Component Analysis to the Fermilab Booster*, the Physical Review Special Topics in Accelerators and Beams, **8**, 064001 (2005); Fermilab-PUB-05-325-AD.
112. S.Y. Lee, S.R. Mane, *Comment on "Quasiperiodic spin-orbit motion and spin tunes in storage rings*, Physical Review Special Topics in Accelerators and Beams, **8**, 089001 (2005)
113. X. Huang, S.Y. Lee, K.Y. Ng, and Y. Su, *Emittance measurement and modeling for the Fermilab Booster*, the Physical Review Special Topics in Accelerators and Beams **9**, 014202 (2006).
114. H.P. Chang, S.Y. Lee, and Y. Yan, *Method for Symplectic Mapping in Systems with Three-Dimensional Magnetic Fields*, Nucl. Instru. Meth. **A558**, 66 (2006); H.P. Chang, S.Y. Lee, and Y. Yan, *Symplectic Mapping in Systems with Three-Dimensional Magnetic Fields*, Chinese Journal of Physics **44**, 150 (2006).
115. S.Y. Lee, *Spin resonance strength of a localized rf magnetic field*, Phys. Rev. Special Topics in Accelerators and Beams, **9**, 074001 (2006).
116. S.Y. Lee, *A Fundamental Limit of Non-scaling FFAG Accelerators*, Phys. Rev. Lett. **97**, 104801 (2006)
117. S.Y. Lee, G. Franchetti, I. Hofmann, F. Wang, and L. Yang *Emittance Growth Mechanisms for the Space Charge Dominated Beams in the FFAG and Proton Driver Rings*, New J. Phys. **8**, 291 (2006)
118. F. Lin, *et al.*, *Exploration of horizontal intrinsic spin resonances with two partial Siberian snakes*, Phys. Rev. Special Topics in Accelerators and Beams, **10**, 044001 (2007).
119. M.H. Wang *et al.*, *Quadruple-bend achromatic low emittance lattice studies*, Review of Scientific Instruments **78**, 055109 (2007).
120. S.Y. Lee, J. Kolski, Z. Liu, X. Pang, C. Park, W. Tam, and F. Wang, *A low energy electron storage ring with tunable compaction factor*, Review of Scientific Instruments **78**, 075107 (2007).

121. S.Y. Lee, W.M. Tam, Z. Liu, *Strip-Injection for Carbon Ion Synchrotrons*, Review of Scientific Instruments **78**, 096104 (2007).
122. R.J. Macek *et al*, *Experimental Test of a Prototype System for Active Damping of the e-p instability at the LANL PSR*, PSR-technote 06-005, LA-UR-06-1884 (2006); JOURNAL OF APPLIED PHYSICS **102**, 124904 (2007).
123. Y. Sato, J. Holmes, S.Y. Lee and R. Macek, *Electron Cloud Simulations of PSR using Cold Proton Bunches*, PRSTAB **11**, 024001 (2008).
124. F. Wang, and S.Y. Lee, *Vertical beam emittance correction with independent component analysis measurement method*, PR-STAB **11**, 050701 (2008).
125. X. Pang, F. Wang, X. Wang, S.Y. Lee and K.Y. Ng, *Emittance Growth Scaling Laws for Crossing Systematic Space-Charge Driven Sixth-Order Resonances and Octupole Driven Fourth-Order Resonances*, invited talk and in the Proceedings of HB2008 (2008),
126. S.Y. Lee, Y.C. Jing, T. Luo, X. Pang, X. Wang, K.Y. Ng, *Diffraction grating structure for coherent light source production*, Review of Scientific Instruments **80**, 066102 (2009).
127. X. Pang, S.Y. Lee, *ICA for beam measurements* Journal of Applied Physics