

Dr. Roland Winkler: List of Publications

July 23, 2009

Books

- [1] *Spin-Orbit Coupling Effects in Two-Dimensional Electron and Hole Systems*
R. Winkler, Springer Tracts in Modern Physics (Springer, Berlin, 2003), Vol. 191.
Full text available online at <http://www.springerlink.com>

Invited Articles

- [2] *Spin-Orbit Interaction and Transport in GaAs Two-Dimensional Holes*
B. Habib, M. Shayegan, and **R. Winkler**; special issue “The Effects of Spin-Orbit Interaction on Charge Transport” *Semicond. Sci. Technol.* **24**, 064002 (2009), 13 pages.
- [3] *Spin Orientation of Holes in Quantum Wells*
R. Winkler, D. Culcer, S. J. Papadakis, B. Habib, and M. Shayegan; special issue “Optical Orientation”, *Semicond. Sci. Technol.* **23**, 114017 (2008), 13 pages.
- [4] *Spin-Dependent Transport of Carriers in Semiconductors*
R. Winkler, in *Handbook of Magnetism and Advanced Magnetic Materials*, edited by H. Kronmüller and S. Parkin, (Wiley, Chichester, 2007), Vol. V, p. 2830, 14 pages.
- [5] *Magnetic Focusing of Charge Carriers From Spin-Split Bands: Semiclassics of a Zitterbewegung Effect*
U. Zülicke, J. Bolte, and **R. Winkler**, *New J. Phys.* **9**, 355 (2007), 14 pages.
- [6] *Maple 11 – mit neuen Physik-Werkzeugen (product review)*
R. Winkler, *Physik Journal* **6(6)**, 60 (2007), 3 pages.
“*Physik Journal*” is the monthly journal for the members of the German Physical Society
- [7] *F. Wang: Physics with Maple (book review)*
R. Winkler, *Physik Journal* **5(9)**, 121 (2006), 1 page.
- [8] *Spin statt Ladung*
R. Winkler, *Physik Journal* **4(12)**, 17 (2005), 2 pages.
- [9] *Spintronik*
R. Winkler and M. Oestreich, *Physik Journal* **3(11)**, 39 (2004), 6 pages.

- [10] *Spin-Orbit Coupling in Two-Dimensional Electron and Hole Systems*
R. Winkler, S. J. Papadakis, E. P. De Poortere, and M. Shayegan, in *Advances in Solid State Physics*, edited by B. Kramer (Springer, Heidelberg, 2001), Vol. 41, p. 211, 13 pages.

Articles in Refereed Journals

- [11] *Spin Angular Impulse due to Spin-Dependent Reflection off a Barrier*
V. Teodorescu and **R. Winkler**, *Phys. Rev. B* **80**, 041311(R) (2009), 4 pages.
- [12] *External Gates and Transport in Biased Bilayer Graphene*
D. Culcer and **R. Winkler**, *Phys. Rev. B* **79**, 165422 (2009), 6 pages.
- [13] *Current-Induced Spin Torques in III-V Ferromagnetic Semiconductors*
D. Culcer, M. E. Lucassen, R. A. Duine, and **R. Winkler**, *Phys. Rev. B* **79**, 155208 (2009), 9 pages.
- [14] *Weak Momentum Scattering and the Conductivity of Graphene*
D. Culcer and **R. Winkler**, *Phys. Rev. B* **78**, 235417 (2008), 10 pages.
- [15] *Strain-Induced Fermi Contour Anisotropy of GaAs 2D Holes*
J. Shabani, M. Shayegan, and **R. Winkler**, *Phys. Rev. Lett.* **100**, 096803 (2008), 4 pages.
- [16] *Nanospintronics Meets Relativistic Quantum Physics: Ubiquity of Zitterbewegung Effects*
U. Zülicke, **R. Winkler**, and J. Bolte, *Physica E* **40**, 1434 (2008), 2 pages.
- [17] *Generation of Spin Currents and Spin Densities in Systems With Reduced Symmetry*
D. Culcer and **R. Winkler**, *Phys. Rev. Lett.* **99**, 226601 (2007), 4 pages.
- [18] *Steady States of Spin Distributions in the Presence of Spin-Orbit Interactions*
D. Culcer and **R. Winkler**, *Phys. Rev. B* **76**, 245322 (2007), 10 pages.
- [19] *Spin Polarization Decay in Spin-1/2 and Spin-3/2 Systems*
D. Culcer and **R. Winkler**, *Phys. Rev. B* **76**, 195204 (2007), 6 pages.
- [20] *Anisotropic Low-Temperature Piezoresistance in (311)A GaAs Two-Dimensional Holes*
B. Habib, J. Shabani, E. P. De Poortere, M. Shayegan and **R. Winkler**, *Appl. Phys. Lett.* **91**, 12107 (2007), 3 pages.
- [21] *Oscillatory Multiband Dynamics of Free Particles: Ubiquity of Zitterbewegung Effects*
R. Winkler, U. Zülicke, and J. Bolte, *Phys. Rev. B* **75**, 205314 (2007), 10 pages.
- [22] *Tuning of the Spin-Orbit Interaction in Two-Dimensional GaAs Holes via Strain*
B. Habib, J. Shabani, E. P. De Poortere, M. Shayegan, and **R. Winkler**, *Phys. Rev. B* **75**, 153304 (2007), 4 pages.

- [23] *Transport evidence of the lowest Landau-level spin-index anticrossing in (110) GaAs two-dimensional holes*
F. Fischer, **R. Winkler**, D. Schuh, M. Bichler, and M. Grayson, *Phys. Rev. B* **75**, 073303 (2007), 4 pages.
- [24] *Spin Precession and Alternating Spin Polarization in Spin-3/2 Hole Systems*
D. Culcer, C. Lechner, and **R. Winkler**, *Phys. Rev. Lett.* **97**, 106601 (2006), 4 pages.
- [25] *Giant Anisotropy of Zeeman Splitting of Quantum Confined Acceptors in Si/Ge*
K.-M. Haendel, **R. Winkler**, U. Denker, O. G. Schmidt, and R. J. Haug, *Phys. Rev. Lett.* **96**, 086403 (2006), 4 pages.
- [26] *Spin Effects in Quantum Dots*
J. Königmann, **R. Winkler**, D. K. Maude, and R. J. Haug, *Phys. Status Solidi B* **243**, 3678 (2006), 4 pages.
- [27] *Spin Polarization of Quasi Two-Dimensional Hole Systems*
R. Winkler, *Phys. Rev. B* **71**, 113307 (2005), 4 pages.
- [28] *Anomalous Spin Polarization of GaAs Two-Dimensional Hole Systems*
R. Winkler, E. Tutuc, S. J. Papadakis, S. Melinte, M. Shayegan, D. Wasserman, and S. A. Lyon, *Phys. Rev. B* **72**, 195321 (2005), 6 pages.
- [29] *Optical Orientation of Electron Spins in GaAs Quantum Wells*
S. Pfalz, **R. Winkler**, T. Nowitzki, D. Reuter, A. D. Wieck, D. Hägele, and M. Oestreich, *Phys. Rev. B* **71**, 165305 (2005), 11 pages.
- [30] *Design Considerations for Semiconductor Spin Lasers*
M. Oestreich, J. Rudolph, **R. Winkler**, and D. Hägele, *Superlatt. Microstruct.* **37**, 306 (2005), 7 pages.
- [31] *Spin Density Matrix of Spin-3/2 Hole Systems*
R. Winkler, *Phys. Rev. B* **70**, 125301 (2004), 8 pages.
- [32] *Spin Orientation and Spin Precession in Inversion-Asymmetric Quasi Two-Dimensional Electron Systems*
R. Winkler, *Phys. Rev. B* **69**, 045317 (2004), 9 pages.
- [33] *Spin Splitting in GaAs (100) Two-Dimensional Holes*
B. Habib, E. Tutuc, S. Melinte, M. Shayegan, D. Wasserman, S. A. Lyon, and **R. Winkler**, *Phys. Rev. B* **69**, 113311 (2004), 4 pages.
- [34] *Negative Differential Rashba Effect in Two-Dimensional Hole Systems*
B. Habib, E. Tutuc, S. Melinte, M. Shayegan, D. Wasserman, S. A. Lyon, and **R. Winkler**, *Appl. Phys. Lett.* **85**, 3151 (2004), 3 pages.
- [35] *Temperature Dependence of Dyakonov-Perel Spin Relaxation in Zinc Blende Semiconductor Quantum Structures*
J. Kainz, U. Rössler, and **R. Winkler**, *Phys. Rev. B* **70**, 195322 (2004), 9 pages.

- [36] *Role of Finite Layer Thickness in Spin Polarization of GaAs Two-Dimensional Electrons in Strong Parallel Magnetic Fields*
E. Tutuc, S. Melinte, E. P. De Poortere, M. Shayegan, and **R. Winkler**, *Phys. Rev. B* **67**, 241309(R) (2003), 4 pages.
- [37] *Anisotropic Spin-Splitting and Spin-Relaxation in Asymmetric Zinc Blende Semiconductor Quantum Structures*
J. Kainz, U. Rössler, and **R. Winkler**, *Phys. Rev. B* **68**, 075322 (2003), 6 pages.
- [38] *Chaos and Open Orbits in Hole-Antidot Arrays with Non-Isotropic Fermi Surface*
M. Zitzlsperger, R. Onderka, M. Suhrke, U. Rössler, D. Weiss, W. Wegscheider, M. Bichler, **R. Winkler**, Y. Hirayama, and K. Muraki, *Europhys. Lett.* **61**, 382 (2003), 7 pages.
- [39] *Anomalous Magneto-Oscillations and Spin Precession*
S. Keppeler and **R. Winkler**, *Phys. Rev. Lett.* **88**, 046401 (2002), 4 pages.
- [40] *Anomalous Rashba Spin Splitting in Two-Dimensional Hole Systems*
R. Winkler, H. Noh, E. Tutuc, and M. Shayegan, *Phys. Rev. B* **65**, 155303 (2002), 4 pages.
- [41] *Highly Anisotropic g -Factor of Two-Dimensional Hole Systems*
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R. Winkler, S. J. Papadakis, E. P. De Poortere, and M. Shayegan, *Phys. Rev. Lett.* **84**, 713 (2000), 4 pages.
- [43] *Rashba Spin Splitting in Two-Dimensional Electron and Hole Systems*
R. Winkler, *Phys. Rev. B* **62**, 4245 (2000), 4 pages.
- [44] *Anisotropic Magnetoresistance of Two-Dimensional Holes in GaAs*
S. J. Papadakis, E. P. De Poortere, M. Shayegan, and **R. Winkler**, *Phys. Rev. Lett.* **84**, 5592 (2000), 4 pages.
- [45] *Generalization of $\mathbf{k} \cdot \mathbf{p}$ Theory for Periodic Perturbations*
R. Stubner, **R. Winkler**, and O. Pankratov, *Phys. Rev. B* **62**, 1843 (2000), 8 pages.
- [46] *The Effect of Spin-Splitting on the Metallic Behavior of a Two-Dimensional System*
S. J. Papadakis, E. P. De Poortere, H. C. Manoharan, M. Shayegan, and **R. Winkler**, *Science* **283**, 2056 (1999), 3 pages.
- [47] *L-Point Backfolding in Ordered GaInP₂ Determined by Electroabsorption Measurements*
T. Kippenberg, J. Krauss, J. Spieler, P. Kiesel, G. H. Döhler, R. Stubner, **R. Winkler**, O. Pankratov, and M. Moser, *Phys. Rev. B* **60**, 4446 (1999), 4 pages.
- [48] *Spin-Resolved Commensurability Oscillations*
J. P. Lu, M. Shayegan, L. Wissinger, U. Rössler, and **R. Winkler**, *Phys. Rev. B* **60**, 13776 (1999), 4 pages.

- [49] *Tunable Spin-Splitting and Spin-Resolved Ballistic Transport in GaAs/AlGaAs Two-Dimensional Holes*
J. P. Lu, J. B. Yau, S. P. Shukla, M. Shayegan, L. Wissinger, U. Rössler, and **R. Winkler**, *Phys. Rev. Lett.* **81**, 1282 (1998), 4 pages.
- [50] *Spin Splitting in the Electron Subband of Asymmetric GaAs/Al_xGa_{1-x}As Quantum Wells: The Multiband Envelope Function Approach*
L. Wissinger, U. Rössler, **R. Winkler**, B. Jusserand, and D. Richards, *Phys. Rev. B* **58**, 15375 (1998), 3 pages.
- [51] *Crossing of Conduction- and Valence-Subband Landau Levels in an Inverted HgTe/CdTe Quantum Well*
M. Schultz, U. Merkt, A. Sonntag, U. Rössler, **R. Winkler**, T. Colin, P. Helgesen, T. Skauli, and S. Lovold, *Phys. Rev. B* **57**, 14772 (1998), 4 pages.
- [52] *Charge Transfer and Dipole Moments of Polyatomic Systems*
R. Winkler and S. T. Pantelides, *J. Chem. Phys.* **106**, 7714 (1997), 6 pages.
- [53] *Theory for the Cyclotron Resonance of Holes in Strained Asymmetric Ge-SiGe Quantum Wells*
R. Winkler, M. Merkler, T. Darnhofer, and U. Rössler, *Phys. Rev. B* **53**, 10858 (1996), 8 pages.
- [54] *Anisotropic Hole Subband States and Interband Optical Absorption in [mmn] Oriented Quantum Wells*
R. Winkler and A. I. Nesvizhskii, *Phys. Rev. B* **53**, 9984 (1996), 9 pages.
- [55] *Exciton Transfer in Asymmetric Double Quantum Wells: the One-LO Phonon Process*
F. C. Michl, **R. Winkler**, and U. Rössler, *Solid State Commun.* **99**, 13 (1996), 6 pages.
- [56] *Electron Effective Mass and Nonparabolicity in Ga_{0.47}In_{0.53}As/InP Quantum Wells*
C. Wetzel, **R. Winkler**, M. Drechsler, B. K. Meyer, U. Rössler, J. Scriba, J. P. Kotthaus, V. Härle, and F. Scholz, *Phys. Rev. B* **53**, 1038 (1996), 4 pages.
- [57] *Cyclotron Resonance and Subband-Landau Level Coupling in 2D Electron and Hole Gases*
R. Winkler, *Surf. Sci.* **361/362**, 411 (1996), 4 pages
[Proceedings of the 11th International Conference on Electronic Properties of Two-Dimensional Systems, (Nottingham, 1995)].
- [58] *Excitons and Fundamental Absorption in Quantum Wells*
R. Winkler, *Phys. Rev. B* **51**, 14395 (1995), 15 pages.
- [59] *Multicomponent Envelope Function Problems: The Ultimate Concept*
R. Winkler and U. Rössler, *Surf. Sci.* **305**, 295 (1994), 6 pages
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- [60] *General Approach to the Envelope-Function Approximation based on a Quadrature Method*
R. Winkler and U. Rössler, *Phys. Rev. B* **48**, 8918 (1993), 10 pages.

- [61] *A Note on Analytic Quadratic Brillouin Zone Integration*
R. Winkler, *J. Phys.: Condens. Matter* **5**, 2321 (1993), 12 pages.
- [62] *Tunneling Spectroscopy of a 2DEG in InAs: Experiment and Theory*
R. Winkler, U. Kunze, and U. Rössler, *Surf. Sci.* **263**, 222 (1992), 5 pages
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Submitted Articles

- [63] *Absence of the Rashba Effect in Undoped Asymmetric Quantum Wells*
 P. S. Eldridge, W. J. H. Leyland, J. D. Mar, P. G. Lagoudakis, **R. Winkler**, O. Z. Karimov, M. Henini, D. Taylor, R. T. Phillips, and R. T. Harley, [arXiv:0807.4845](https://arxiv.org/abs/0807.4845) (2008), 7 pages.
- [64] *Trigonal Band Structure and Time-Reversal Invariance in Graphene*
R. Winkler and U. Zülicke, [arXiv:0807.4204](https://arxiv.org/abs/0807.4204) (2008), 4 pages.

Other Publications

- [65] *Zeeman Splitting of Zero-Dimensional Heavy-Hole States in a Strongly Strained Ge Quantum Well*
 O. B. Agafonov, K.-M. Händel, **R. Winkler**, U. Denker, O. G. Schmidt, and R. J. Haug, *AIP Conf. Proc.* **893**, 1369 (2007), 2 pages.
- [66] *Rashba Spin Splitting and Ehrenfest's Theorem*
R. Winkler, *Physica E* **22**, 450 (2004), 5 pages.
- [67] *Anisotropic Spin Splitting and Spin Relaxation in AlGaAs/GaAs Quantum Structures*
 J. Kainz, U. Rössler, and **R. Winkler**, *J. Supercond.* **16**, 323 (2003), 4 pages.
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 [Proceedings of the 14th International Conference on Electronic Properties of Two-Dimensional Systems, (Prague, 2001)].
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- [73] *Zeeman Effect of D_1 Bound Exciton in 4H-SiC*
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- [74] *Intersubband Transitions in Coupled Wells with Disorder*
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- [80] *Dynamics of Excitons in Asymmetric Double Quantum Wells: Absorption and Relaxation*
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- [82] *Quantum Resonances of Holes in Strained Ge-Si_xGe_{1-x} Quantum Wells*
M. Merkler, **R. Winkler**, T. Darnhofer, and U. Rössler, in *Proceedings of the 11th International Conference on High Magnetic Fields in Semiconductor Physics (Cambridge, 1994)*, edited by D. Heiman (World Scientific, Singapore, 1995), p. 624, 4 pages.
- [83] *Tunnelspektroskopische Untersuchung eines 2DEG auf InAs im Hochmagnetfeld: Experiment und Theorie*
R. Winkler, U. Kunze, and U. Rössler, *Wiss. Ber. HMFA Braunschweig* **11**, 45 (1989/90), 7 pages.