

Timothy B. Boykin

DEGREES

Ph.D. (Electrical Engineering), Stanford University, 1992.

A Tight-Binding Approach to Resonant Tunneling Diode Simulation, 1992.

Prof. James S. Harris, Jr., advisor.

M.S. (Electrical Engineering), Stanford University, 1988.

B.S.E.E., *summa cum laude*, Rice University, 1987.

EMPLOYMENT and EXPERIENCE

September, 1992 - Present

Department of Electrical and Computer Engineering, The University of Alabama in Huntsville.

Professor (August, 2007-Present).

Associate Professor (August, 1997-August, 2007; tenured since August, 2008).

Assistant Professor (September, 1992-August, 1997).

June, 1992 - September, 1992

Post-Doctoral Research Associate, Department of Electrical Engineering, Stanford University.

June, 1988 - June, 1992

Research Assistant, Department of Electrical Engineering, Stanford University.

Summers, 1984 - 1987

MITRE Corporation, Houston, Texas. Computer system performance evaluation.

HONORS and AWARDS

Fellow, Institute of Electrical and Electronics Engineers, 2018.

Fellow, American Physical Society, 2011.

ACM Gordon Bell Prize, Honorable Mention (SC11), 2011.

UAH College of Engineering Outstanding Faculty Award, 2012.

UAH Foundation Research Award (Applied Research), 2001.

Elected to Sigma Xi, 1994.

Stanford Graduate Fellowship, 1987-88.

Elected to Phi Beta Kappa, 1987.

Elected to Tau Beta Pi, 1986.

Elected to Eta Kappa Nu, 1986.

PROFESSIONAL SOCIETIES

American Physical Society, Fellow.

IEEE, Fellow.

Referee/Reviewer for: *Physical Review Letters*, *Physical Review B*, *Physical Review E*, *Journal of Physics: Condensed Matter*, *New Journal of Physics*, *American Journal of Physics*, *European Journal of Physics*, *IEEE Transactions on Electron Devices*, *IEEE Electron Device Letters*, *IEEE Transactions on Nanotechnology*, *Journal of Applied Physics*, *Applied Physics Letters*, *Journal of Computational Electronics*, *Solid State Communications*, *Physica B & E*.

BOOK CHAPTERS/ENCYCLOPEDIA ARTICLES

6. G. Klimeck and T. Boykin, "Tight-Binding Models, Their Applications to Device Modeling, and Deployment to a Global Community," in *Springer Handbook of Semiconductor Devices*, ed. M. Rudan, R. Brunetti, and S. Reggiani, 1601-1640, (Springer, Cham, Switzerland, 2023). [UAH]
5. S. Ahmed, N. Kharche, R. Rahman, M. Usman, S. Lee, H. Ryu, H. Bae, S. Clark, B. Haley, M. Naumov, F. Saied, M. Korkusinski, R. Kennel, M. McLennan, T. Boykin, and G. Klimeck, "Multimillion Atom Simulation of Electronic and Optical Properties of Nanoscale Devices using NEMO 3-D," in *Encyclopedia of Complexity and System Science*, 1-69, (Springer, New York, 2015). (Updated edition from 2009 & 2013.) [UAH]
4. S. Ahmed, N. Kharche, R. Rahman, M. Usman, S. Lee, H. Ryu, H. Bae, S. Clark, B. Haley, M. Naumov, F. Saied, M. Korkusinski, R. Kennel, M. McLennan, T. Boykin, and G. Klimeck, "Multimillion Atom Simulation of Electronic and Optical Properties of Nanoscale Devices using NEMO 3-D," in *Encyclopedia of Complexity and System Science*, Article ID: 60515, Chapter ID: 343, (Springer, New York, 2013). [UAH]
3. S. Ahmed, N. Kharche, R. Rahman, M. Usman, S. Lee, H. Ryu, H. Bae, S. Clark, B. Haley, M. Naumov, F. Saied, M. Korkusinski, R. Kennel, M. McLennan, T. Boykin, and G. Klimeck, "Multimillion Atom Simulations with NEMO 3-D," in *Encyclopedia of Complexity and System Science*, vol. 6, ed. R. A. Meyers, pp. 5745-5783, (Springer, New York, 2009). [UAH]
2. Timothy B. Boykin, "Quantum Mechanical Description of Solids," sec. 6.4.3.3 of *Encyclopedia of Life Support Systems (EOLSS)*, UNESCO-sponsored (2001) [UAH].
1. Timothy B. Boykin, "Tailoring Empirical Tight-Binding Models for Semiconductor Heterostructures," in Stoyan J. Vlaev and L. M. Gaggero-Sager, eds., *Some Contemporary Problems of Condensed Matter Physics*, (Nova Science Publishers, Huntington, New York, 2000), pp. 39-63. [UAH]

REFEREED JOURNAL ARTICLES

The code in square brackets following each entry indicates the institution at which the work was performed: University of Alabama in Huntsville [UAH] or Stanford University [SU].

Published or Accepted for Publication

101. Mondol Anik Kumar, Indranil Chatterjee, Timothy Boykin, and Biswajit Ray, "State Dependent Threshold Voltage Shift in Irradiated 64-Layer 3D NAND Memories," *IEEE Transactions on Nuclear Science* **72**, 2498 (2025). [UAH]
100. Mondol Anik Kumar, Md Raquibuzzaman, Matchima Buddhanoy, Timothy Boykin, Biswajit Ray, "Origin of post-irradiation V_t-loss variability in 3D-NAND memory array," *IEEE Transactions on Nuclear Science* **71**, 405 (2024). [UAH]
99. Timothy B. Boykin, "The position-momentum commutator as a generalized function:

Resolution of the apparent discrepancy between continuous and discrete bases,” *Foundations of Physics* **53**, 56 (2023). [UAH]

98. Timothy B. Boykin, “Digital orbitals: Connecting the tight-binding and plane-wave approaches through sampled-real-space models,” *European Journal of Physics* **42**, 065501 (2021). [UAH]
97. Umeshwarnath Surendranathan, Preeti Kumari, Maryla Wasiolek, Khalid Hattar, Timothy Boykin, and Biswajit Ray, “Gamma-Ray-Induced Error Pattern Analysis for MLC 3-D NAND Flash Memories,” *IEEE Transactions on Nuclear Science* **68**, 733 (2021). [UAH]
96. Sijay Huang, Timothy B. Boykin, Ravi S. Gorur, and Biswajit Ray, “Electrical Tree Formation in Polymer-Filler Composites,” *IEEE Transactions on Dielectrics and Electrical Insulation* **26**, 1853 (2019). [UAH]
95. Timothy B. Boykin, “The discretized momentum operator,” *The Physics Educator* **1**, 1920003 (2019). [UAH]
94. Timothy B. Boykin, Prasad Sarangapani, and Gerhard Klimeck, “Non-orthogonal tight-binding models: Problems and possible remedies for realistic nano-scale devices,” *Journal of Applied Physics* **125**, 144302 (2019). [UAH]
93. M. Raquibuzzaman, B. Ray, T. B. Boykin, and R. S. Gorur, “Polymer-Metal Layered Structures for Improved Energy Storage Density,” *IEEE Transactions on Dielectrics and Electrical Insulation* **25**, 2375 (2018). [UAH]
92. Timothy B. Boykin and Arvind Ajoy, “Effective bandstructures from unfolding supercells with vacancies,” *Physica B* **531**, 130 (2018). [UAH]
91. Timothy B. Boykin and Gerhard Klimeck, “Insights from simple models for surface states in nanostructures,” *European Journal of Physics* **38**, 025501 (2017). [UAH]
90. Yaohua Tan, Michael Povolotskyi, Tillmann Kubis, Timothy B. Boykin, and Gerhard Klimeck, “Transferable tight-binding model for strained group IV and III-V materials and heterostructures,” *Physical Review B* **94**, 045311 (2016). [UAH]
89. Timothy B. Boykin, Arvind Ajoy, Hesameddin Ilatikhameneh, Michael Povolotskyi, and Gerhard Klimeck, “Unfolding and effective bandstructure calculations as discrete real- and reciprocal-space operations,” *Physica B* **491**, 22 (2016). [UAH]
88. Yaohua P. Tan, Michael Povolotskyi, Tillmann Kubis, Timothy B. Boykin, and Gerhard Klimeck, “Tight-binding analysis of Si and GaAs ultrathin bodies with subatomic wave-function resolution,” *Physical Review B* **92**, 085301 (2015). [UAH]
87. Timothy B. Boykin, Arvind Ajoy, Hesameddin Ilatikhameneh, Michael Povolotskyi, and Gerhard Klimeck, “Brillouin zone unfolding method for effective phonon spectra,” *Physical*

86. SungGeun Kim, Mathieu Luisier, Timothy B. Boykin, and Gerhard Klimeck, “Computational Study of Heterojunction Graphene Nanoribbon Tunneling Transistors with p/d Orbital Tight-binding Method,” *Applied Physics Letters* **104**, 243113 (2014). [UAH]
85. Ganesh Hegde, Michael Povolotskyi, Tillmann Kubis, Timothy Boykin, and Gerhard Klimeck, “An environment-dependent semi-empirical tight binding model suitable for electron transport in bulk metals, metal alloys, metallic interfaces, and metallic nanostructures. I. Model and validation,” *Journal of Applied Physics* **115**, 123703 (2014). [UAH]
84. Timothy B. Boykin, “Effective interactions and block diagonalization in quantum-mechanical problems,” *Journal of Mathematical Chemistry* **52**, 1599 (2014). [UAH]
83. Neerav Kharche, Timothy B. Boykin, and Saroj K. Nayak, “Multiscale Modeling of Screening Effects on Conductivity of Graphene in Weakly Bonded Graphene-Dielectric Heterostructures,” *Journal of Computational Electronics* **12**, 722 (2013). [UAH]
82. Xueping Jiang, Neerav Kharche, Paul Kohl, Timothy B. Boykin, Gerhard Klimeck, Mathieu Luisier, Pulickel M. Ajayan, and Saroj K. Nayak, “Giant Quasiparticle Band Gap Modulation in Graphene Nanoribbons Supported on Weakly Interacting Surfaces,” *Applied Physics Letters* **103**, 133107 (2013). [UAH]
81. M. Luisier, T. B. Boykin, Z. Ye, A. Martini, G. Klimeck, N. Kharche, X. Jaing, and S. Nayak, “Investigation of ripple-limited low-field mobility in large-scale graphene nanoribbons,” *Applied Physics Letters* **102**, 253506 (2013). [UAH]
80. Zhengping Jiang, Marcelo A. Kuroda, Yaohua Tan, Dennis M. Newns, Michael Povolotskyi, Timothy B. Boykin, Tillmann Kubis, Gerhard Klimeck, and Glenn J. Martyna, “Electron transport in nano-scaled piezoelectronic devices,” *Applied Physics Letters* **102**, 193501 (2013). [UAH]
79. Yaohua Tan, Michael Povolotskyi, Tillmann Kubis, Yu He, Zhengping Jiang, Gerhard Klimeck, and Timothy B. Boykin, “Empirical tight-binding parameters for GaAs and MgO with explicit basis through DFT mapping,” *Journal of Computational Electronics* **12**, 56 (2013). [UAH]
78. Mehdi Salmani-Jelodar, Abhijeet Paul, Timothy Boykin, and Gerhard Klimeck, “Calculation of phonon spectrum and thermal properties in suspended $\langle 100 \rangle$ $\text{In}_x\text{Ga}_{1-x}\text{As}$ nanowires,” *Journal of Computational Electronics* **11**, 22 (2012) (INVITED). [UAH]
77. Zhengping Jiang, Neerav Kharche, Timothy Boykin, and Gerhard Klimeck, “Effects of interface disorder on valley splitting in SiGe/Si/SiGe quantum wells,” *Applied Physics Letters* **100**, 103502 (2012). [UAH]
76. Sung Geun Kim, Mathieu Luisier, Timothy B. Boykin, and Gerhard Klimeck, “Effects of

interface roughness scattering on radio frequency performance of silicon nanowire transistors,” *Applied Physics Letters* **99**, 232107 (2011). [UAH]

75. Muhammad Usman, Yui-Hong Matthias Tan, Hoon Ryu, Shaikh S. Ahmed, Hubert J. Krenner, Timothy B. Boykin, and Gerhard Klimeck, “Quantitative excited state spectroscopy of a single InGaAs quantum dot molecule through multi-million-atom electronic structure calculations,” *Nanotechnology* **22**, 315709 (2011). [UAH]
74. Timothy B. Boykin, Mathieu Luisier, Gerhard Klimeck, Xueping Jiang, Neerav Kharche, and Saroj K. Nayak, “Accurate six-band nearest-neighbor tight-binding model for the π -bands of bulk graphene and graphene nanoribbons,” *Journal of Applied Physics* **109**, 104304 (2011) [UAH].
73. SungGeun Kim, Abhijeet Paul, Mathieu Luisier, Timothy B. Boykin, and Gerhard Klimeck, “Full Three-Dimensional Quantum Transport Simulation of Atomistic Interface Roughness in Silicon Nanowire FETs,” *IEEE Transactions on Electron Devices* **58**, 1371 (2011). [UAH]
72. Timothy B. Boykin, Mathieu Luisier, and Gerhard Klimeck, “Current density and continuity in discretized models,” *European Journal of Physics* **31**, 1077 (2010); Corrigendum **32**, 631 (2011). [UAH]
71. Timothy B. Boykin, Mathieu Luisier, Mehdi Salmani-Jelodar, and Gerhard Klimeck, “Strain-induced, off-diagonal, same-atom parameters in empirical tight-binding theory suitable for [110] uniaxial strain applied to a silicon parameterization,” *Physical Review B* **81**, 125202 (2010). [UAH]
70. Samarth Agarwal, Kyle H. Montgomery, Timothy B. Boykin, Gerhard Klimeck, and Jerry M. Woodall, “Design Guidelines for True Green LEDs and High Efficiency Photovoltaics Using ZnSe/GaAs Digital Alloys,” *Electrochemical and Solid State Letters* **13**, H5 (2010). [UAH]
69. Timothy B. Boykin, “Recent developments in tight-binding approaches for nanowires,” *Journal of Computational Electronics* **8**, 142 (2009). (INVITED) [UAH]
68. Rajib Rahman, Seung H. Park, Timothy B. Boykin, Gerhard Klimeck, Sven Rogge, and Lloyd C. L. Hollenberg, “Gate-induced g-factor control and dimensional transition for donors in multivalley semiconductors,” *Physical Review B* **80**, 115301 (2009). [UAH]
67. Neerav Kharche, Seongmin Kim, Timothy B. Boykin, and Gerhard Klimeck, “Valley degeneracies in (111) silicon quantum wells,” *Applied Physics Letters* **94**, 042101 (2009). [UAH]
66. Timothy B. Boykin, Neerav Kharche, and Gerhard Klimeck, “Non-primitive rectangular supercells for tight-binding electronic structure calculations,” *Physica E* **41**, 490 (2009). [UAH]

65. Neerav Kharche, Mathieu Luisier, Timothy B. Boykin, and Gerhrd Klimeck, "Electronic structure and transmission characteristics of SiGe Nanowires," *Journal of Computational Electronics* **7**, 350 (2008). [UAH]
64. Timothy B. Boykin, Neerav Kharche, and Gerhard Klimeck, "Valley splitting in finite barrier quantum wells," *Physical Review B* **77**, 245320 (2008). [UAH]
63. Timothy B. Boykin, Mathieu Luisier, and Gerhard Klimeck, "Multi-band transmission calculations for nanowires using an optimized renormalization method," *Physical Review B* **77**, 165318 (2008). [UAH]
62. Timothy B. Boykin, Neerav Kharche, and Gerhard Klimeck, "Brillouin zone unfolding of perfect supercells having non-equivalent primitive cells illustrated with a Si/Ge tight-binding parameterization," *Physical Review B* **76**, 035310 (2007). [UAH]
61. Gerhard Klimeck, Shaikh Ahmed, Neerav Kharche, Marek Korkusinski, Muhammad Usman, Marta Prada, and Timothy B. Boykin, "Atomistic simulation of realistically sized nanodevices using NEMO 3-D: II-Applications," *IEEE Transactions on Electron Devices* **54**, 2090 (2007). [UAH]
60. Gerhard Klimeck, Shaikh Ahmed, Neerav Kharche, Marek Korkusinski, Muhammad Usman, Marta Prada, and Timothy B. Boykin, "Atomistic simulation of realistically sized nanodevices using NEMO 3-D: I-Models and Benchmarks," *IEEE Transactions on Electron Devices* **54**, 2079 (2007). [UAH]
59. Timothy B. Boykin, Neerav Kharche, and Gerhard Klimeck, "Evolution time and energy uncertainty," *European Journal of Physics* **28**, 673 (2007). [UAH]
58. Neerav Kharche, Marta Prada, Timothy B. Boykin, and Gerhard Klimeck, "Valley-splitting in strained silicon quantum wells modeled with 2° miscuts, step disorder, and alloy disorder," *Applied Physics Letters* **90**, 092109 (2007). [UAH]
57. Timothy B. Boykin, Neerav Kharche, Gerhard Klimeck, and Marek Korkusinski, "Approximate bandstructures of semiconductor alloys from tight-binding supercell calculations," *Journal of Physics: Condensed Matter* **19**, 036203 (2007). [UAH]
56. Timothy B. Boykin, Mathieu Luisier, Andreas Schenk, Neerav Kharche, and Gerhard Klimeck, "The electronic structure and transmission characteristics of disordered AlGaAs nanowires," *IEEE Transactions on Nanotechnology* **6**, 43 (2007). [UAH]
55. Timothy B. Boykin, Neerav Kharche, and Gerhard Klimeck, "Allowed wavevectors under the application of incommensurate periodic boundary conditions," *European Journal of Physics* **27**, 5 (2006). [UAH]
54. A. S. Martins, Timothy B. Boykin, Gerhard Klimeck, and Belita Koiller, "Conduction-band

tight-binding description for Si applied to P donors,” *Physical Review B* **72**, 193204 (2005). [UAH]

53. Timothy B. Boykin and Gerhard Klimeck, “The discretized Schrödinger equation for the finite square well and its relationship to solid state physics,” *European Journal of Physics* **26**, 865 (2005). [UAH]
52. Dennis Hite, Timothy B. Boykin, Nagendra Singh, and Dashen Shen, “A simple Fermi-Dirac Integrating Circuit,” *American Journal of Physics* **73**, 856 (2005). [UAH]
51. Anisur Rahman, Gerhard Klimeck, Mark Lundstrom, Nizami Vagidov, and Timothy B. Boykin, "Atomistic Approach for Nano-Scale Devices at the Scaling Limit and Beyond - Valley Splitting in Si", *Japanese Journal of Applied Physics* **44**, 2187 (2005). [UAH]
50. Yun Zheng, Cristian Rivas, Roger Lake, Khairul Alam, Timothy B. Boykin, and Gerhard Klimeck, "Electronic Properties of Silicon Nanowires", *IEEE Transactions on Electron Devices* **52**, 1097 (2005). [UAH]
49. Jeremy Green, Timothy B. Boykin, Corrie D. Farmer, Michel Garcia, Charles N. Ironside, Gerhard Klimeck, Roger Lake, and Colin R. Stanley, "Quantum cascade laser gain medium modeling using a second-nearest-neighbor sp^3s^* tight-binding model", *Superlattices and Microstructures* **37**, 410 (2005). [UAH]
48. Timothy B. Boykin, Gerhard Klimeck, Paul von Allmen, Fabiano Oyafuso, and Seungwon Lee, “Valley splitting in V-shaped quantum wells,” *Journal of Applied Physics* **97**, 113702 (2005). [UAH]
47. Timothy B. Boykin and Gerhard Klimeck, “Practical application of zone-folding concepts in tight-binding,” *Physical Review B* **71**, 115215 (2005). [UAH]
46. Timothy B. Boykin, Gerhard Klimeck, Mark Friesen, S. N. Coppersmith, Paul von Allmen, Fabiano Oyafuso, and Seungwon Lee, “Valley-splitting in low-density quantum-confined heterostructures studied using tight-binding models,” *Physical Review B* **70**, 165325 (2004). [UAH]
45. Timothy B. Boykin and Gerhard Klimeck, “The discretized Schrödinger equation and simple models for semiconductor quantum wells,” *European Journal of Physics* **25**, 503 (2004). [UAH]
44. Timothy B. Boykin, Gerhard Klimeck, and Fabiano Oyafuso, “Valence band effective mass expressions in the $sp^3d^5s^*$ empirical tight-binding model applied to a Si and Ge parameterization,” *Physical Review B* **69**, 115201 (2004). [UAH]
43. Timothy B. Boykin, Gerhard Klimeck, Mark Eriksson, Mark Friesen, S. N. Coppersmith, Paul von Allmen, Fabiano Oyafuso, and Seungwon Lee, “Valley splitting in strained Si quantum wells,” *Applied Physics Letters* **84**, 115 (2004). [UAH]

42. Fabiano Oyafuso, Gerhard Klimeck, Paul von Allmen, Timothy B. Boykin, and R. Chris Bowen, "Strain effects in large-scale atomistic quantum dot simulations," *Physica Status Solidi b* **239**, 71 (2003). [UAH]
41. Fabiano Oyafuso, Gerhard Klimeck, R. Chris Bowen, Timothy B. Boykin, and Paul von Allmen, "Disorder-induced broadening in multimillion atom alloyed quantum dot systems," *Physica Status Solidi c* **0004**, 1149 (2003). [UAH]
40. Timothy B. Boykin, "Derivatives of the Dirac delta function by explicit construction of sequences," *American Journal of Physics* **71**, 462 (2003). [UAH]
39. Timothy B. Boykin, Gerhard Klimeck, R. Chris Bowen, and Fabiano Oyafuso, "Diagonal parameter shifts due to nearest-neighbor displacements in empirical tight-binding theory," *Physical Review B* **66**, 125207 (2002). [UAH]
38. Gerhard Klimeck, Fabiano Oyafuso, Timothy B. Boykin, R. Chris Bowen, and, Paul von Allmen, "Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots," *Journal of Computer Modeling in Engineering and Science* **3**, 601 (2002); invited. [UAH]
37. Gerhard Klimeck, Fabiano Oyafuso, R. Chris Bowen, Timothy B. Boykin, Thomas A. Cwik, Edith Huang, and Edward Vinyard, "3-D Atomistic Nanoelectronic Modeling on High Performance Clusters: Multimillion Atom Simulations", *Superlattices and Microstructures* **31**, 171 (2002). [UAH]
36. Fabiano Oyafuso, Gerhard Klimeck, R. Chris Bowen, and Timothy B. Boykin, "Atomistic Electronic Structure Calculations of Unstrained Alloyed Systems Consisting of a Million Atoms", *Journal of Computational Electronics* **1**, 317 (2002). [UAH]
35. Timothy B. Boykin, Dennis Hite, and Nagendra Singh, "The two-capacitor problem with radiation," *American Journal of Physics* **70**, 415 (2002). [UAH]
34. Timothy B. Boykin and P. Vogl, "Dielectric response of molecules in empirical tight-binding theory," *Physical Review B* **65** 035202 (2001). [UAH]
33. Timothy B. Boykin, R. Chris Bowen, and Gerhard Klimeck, "Electromagnetic coupling and gauge invariance in the empirical tight-binding method," *Physical Review B* **63**, 245314 (2001). [UAH]
32. Gerhard Klimeck, R. Chris Bowen, and Timothy B. Boykin, "Off zone-center or indirect bandgap-like hole transport in heterostructures," *Physical Review B* **63**, 195310 (2001). [UAH]
31. Gerhard Klimeck, R. Chris Bowen, and Timothy B. Boykin, "Strong wavevector dependence of hole transport in heterostructures," *Superlattices and Microstructures* **29**, 187 (2001).

[UAH]

30. Timothy B. Boykin, "Tight-binding-like expressions for the continuous-space electromagnetic coupling Hamiltonian." *American Journal of Physics* **69**, 793 (2001). [UAH]
29. Gerhard Klimeck, R. Chris Bowen, Timothy B. Boykin, and Thomas A. Cwik, " sp^3s^* tight-binding parameters for transport simulations in compound semiconductors," *Superlattices and Microstructures* **27**, 519 (2000). [UAH]
28. Gerhard Klimeck, R. Chris Bowen, Timothy B. Boykin, Carlos Salazar-Lazaro, Thomas A. Cwik, and Adrian Stoica, "Tight-binding models for Si quantum devices and parameter fitting using genetic algorithms," *Superlattices and Microstructures* **27**, 77 (2000). [UAH]
27. Timothy B. Boykin, "An alternative view of the continuity equation in quantum mechanics," *American Journal of Physics* **68**, 665 (2000). [UAH]
26. Timothy B. Boykin, "Exact representation of $\exp(i\mathbf{q}\mathbf{r})$ in the empirical tight-binding method and its application to electromagnetic interactions," *Physical Review B* **60**, 15 810 (1999). [UAH]
25. Timothy B. Boykin, R. Chris Bowen, Gerhard Klimeck, and Kevin L. Lear, "Resonant-tunneling diodes with emitter prewells," *Applied Physics Letters* **75**, 1302 (1999). [UAH]
24. J.G. Menchero and Timothy B. Boykin, "Impurity states in semiconductors calculated via tight-binding: a parameter sensitivity study," *Physical Review B* **59**, 8137 (1999). [UAH]
23. Timothy B. Boykin, Roger K. Lake, Gerhard Klimeck, and Mukund Swaminathan, "Interface effects in tunneling models with identical real and complex dispersions," *Physical Review B* **59**, 7316 (1999). [UAH]
22. Timothy B. Boykin, Lisa J. Gamble, Gerhard Klimeck, and R. Chris Bowen, "Valence-band warping in tight-binding models," *Physical Review B* **59**, 7301 (1999). [UAH]
21. Timothy B. Boykin, "A more physical formulation of the self-inductance for spatially distributed circuits," *American Journal of Physics* **67**, 320 (1999). [UAH]
20. Timothy B. Boykin, "More complete treatment of spin-orbit effects in tight-binding models," *Physical Review B* **57**, 1620 (1998). [UAH]
19. Timothy B. Boykin, "Improved fits of effective masses at Γ in the spin-orbit, second-nearest-neighbor sp^3s^* model: results from analytic expressions," *Physical Review B* **56**, 9613 (1997). [UAH]
18. Timothy B. Boykin, Gerhard Klimeck, R. Chris Bowen, and Roger Lake, "Effective mass reproducibility of the nearest-neighbor sp^3s^* models: analytic results," *Physical Review B* **56**, 4102 (1997); Erratum **61**, 5033 (2000). [UAH]

17. Timothy B. Boykin and Herman C. Chui, "Simplified treatment of many-body effects in the intersubband absorption of symmetric, uniformly doped quantum wells at zero temperature," *Physical Review B* **55**, 7091 (1997). [UAH]
16. Timothy B. Boykin, "Tunneling calculations for systems with singular coupling matrices: results for a simple model," *Physical Review B* **54**, 7670 (1996). [UAH]
15. Timothy B. Boykin, "Generalized eigenproblem method for surface and interface states: the complex bands of GaAs and AlAs," *Physical Review B* **54**, 8107 (1996). [UAH]
14. Timothy B. Boykin, "Incorporation of incompleteness in the **kp** perturbation theory," *Physical Review B* **52**, 16 317 (1995). [UAH]
13. Timothy B. Boykin and C.D. Johnson, "A generalized solution expression for linear, homogeneous, constant-coefficient difference equations," *Journal of the Franklin Institute* **332B**, 227 (1995). [UAH]
12. Timothy B. Boykin, "Approximations for the resonant-tunneling diode current: implications for triple-barrier devices," *Journal of Applied Physics* **78**, 6818 (1995). [UAH]
11. Timothy B. Boykin, "Current-voltage calculations for InAs/AlSb resonant-tunneling diodes," *Physical Review B* **51**, 4289 (1995). [UAH]
10. Timothy B. Boykin, R.E. Carnahan, and K.P. Martin, "Inadequacy of the one-dimensional approximation for resonant-tunneling diode current-voltage calculations," *Physical Review B* **51**, 2273 (1995). [UAH]
9. Timothy B. Boykin, R.E. Carnahan, and K.P. Martin, "Validity of the semiclassical interpretation of resonant magnetotunneling experiments," *Physical Review B* **50**, 15 393 (1994). [UAH]
8. Timothy B. Boykin, "Conduction-band states of thin InAs/AlSb quantum wells," *Applied Physics Letters* **64**, 1529 (1994). [UAH]
7. Timothy B. Boykin, R.E. Carnahan, and R.J. Higgins, "Quantum well states of InAs/AlSb resonant tunneling diodes," *Physical Review B* **48**, 14 232 (1993). [UAH]
6. Timothy B. Boykin, "Resonance features of a two-state model," *Physical Review B* **47**, 12696 (1993). [UAH]
5. Timothy B. Boykin, Bardia Pezeshki, and James S. Harris, Jr., "Anti-resonances in the transmission of a simple two-state model," *Physical Review B* **46**, 12 769 (1992). [SU]
4. Timothy B. Boykin, and James S. Harris, Jr., "X-valley tunneling in single AlAs barriers," *Journal of Applied Physics* **72**, 988 (1992). [SU]

3. B. Pezeshki, S.M. Lord, T.B. Boykin, and J.S. Harris, Jr., "GaAs/AlAs quantum wells for electroabsorption modulators," *Applied Physics Letters* **60**, 2779 (1992). [SU]
2. B. Pezeshki, S.M. Lord, T.B. Boykin, B.L. Shoop, and J.S. Harris, Jr., "AlGaAs/GaAs QW modulator for 6328 Å operation," *Electronics Letters* **27**, 1971 (1991). [SU]
1. Timothy B. Boykin, Jan P.A. van der Wagt, and James S. Harris, Jr., "Tight-binding model for GaAs/AlAs resonant tunneling diodes," *Physical Review B* **43**, 4777 (1991). [SU]

CONFERENCE PRESENTATIONS

69. Yaohua Tan, Michael Povolotskyi, Tillmann Kubis, Timothy Boykin, Gerhard Klimeck, "Transferable tight binding model for strained group IV and III-V heterostructures," APS March Meeting, March 14–18, 2016, Baltimore, Maryland. [UAH]
68. Yaohua Tan, Michael Povolotskyi, Tillmann Kubis, Timothy Boykin, Gerhard Klimeck, "Transferable tight binding model for strained group IV and III-V heterostructure," International Workshop on Computational Electronics (IWCE), West Lafayette, USA, 2015. [UAH]
67. Yaohua Tan, Michael Povolotskyi, Tillmann Kubis, Timothy Boykin, Gerhard Klimeck, "Tight Binding analysis of Si/GaAs UTBs with subatomic resolution," 17th International Workshop on Computational Electronics (IWCE), Paris, France, 2014. [UAH]
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