

List of publications

Eduard V. Lavrov*

*Institut für Angewandte Physik/Halbleiterphysik
Technische Universität Dresden*

- [1] A. S. Kaminskii, A. N. Safonov, and E. V. Lavrov, "Decay kinetics of excitons bound to isoelectronic traps in neutron-irradiated silicon," *Sov. Phys.—Solid State* **33**, p. 488, 1991.
- [2] A. S. Kaminskii, E. V. Lavrov, V. A. Karasyuk, and M. L. W. Thewalt, "Photoluminescence of excitons bound to the isoelectronic hydrogen-related defects B_{71}^1 (1.1377 eV) in silicon," *Phys. Rev. B* **50**, p. 7338, 1994.
- [3] A. S. Kaminskii, E. V. Lavrov, V. A. Karasyuk, and M. L. W. Thewalt, "Photoluminescence of excitons bound to the isoelectronic hydrogen-related defects B_{80} (1.1470 eV) and B_{19}^1 (1.1431 eV) in silicon," *Phys. Rev. B* **51**, p. 4882, 1995.
- [4] A. S. Kaminskii and E. V. Lavrov, "Photoluminescence of excitons bound to isoelectronic B_{80}^4 (1.1068 eV) centers in single-crystal in silicon," *JETP* **81**, p. 595, 1995.
- [5] A. S. Kaminskii and E. V. Lavrov, "Excitons bound to isoelectronic C_{3V} -defects B_{80}^4 (1.1068 eV) in silicon," *Mater. Sci. Forum* **196–201**, p. 145, 1995.
- [6] A. S. Kaminskii, E. V. Lavrov, G. Davies, E. C. Lightowers, and A. N. Safonov, "Isoelectronic hydrogen-related defects in silicon," *Semicond. Sci. Technol.* **11**, p. 1796, 1996.
- [7] A. S. Kaminskii, E. V. Lavrov, V. A. Karasyuk, and M. L. W. Thewalt, "Photoluminescence of excitons bound to the radiation damage defects B_{41} (1.1509 eV) in silicon," *Solid State Commun.* **97**, p. 137, 1996.
- [8] A. S. Kaminskii, E. L. Kosarev, and E. V. Lavrov, "Comblike instrumental functions in high-resolution spectroscopy," *Instrum. & Exp. Tech.* **40**, p. 344, 1997.
- [9] A. S. Kaminskii, E. L. Kosarev, and E. V. Lavrov, "Using comb-like instrumental functions in high-resolution spectroscopy," *Meas. Sci. & Technol.* **8**, p. 864, 1997.
- [10] A. S. Kaminskii and E. V. Lavrov, "Uniaxial-stress-induced alignment of the B_{80}^4 (J-lines) centres in silicon," *Solid State Commun.* **106**, p. 751, 1998.
- [11] L. Hoffmann, E. V. Lavrov, and B. Bech Nielsen, "C–H complex in Si observed at low temperatures," *Mater. Sci. & Eng. B* **58**, p. 167, 1999.
- [12] L. Hoffmann, E. V. Lavrov, B. Bech Nielsen, and J. L. Lindström, "Local vibrational modes of a dicarbon–hydrogen center in crystalline silicon," *Physica B* **273–274**, p. 275, 1999.
- [13] E. V. Lavrov, L. Hoffmann, and B. Bech Nielsen, "Local vibrational modes of the metastable dicarbon center C_s-C_i in silicon," *Phys. Rev. B* **60**, p. 8081, 1999.

*e-mail: eduard.lavrov@tu-dresden.de

- [14] E. V. Lavrov, B. Bech Nielsen, J. Byberg, and J. L. Lindström, "Infrared absorption study of a new dicarbon center in silicon," *Physica B* **273–274**, p. 256, 1999.
- [15] L. Hoffmann, E. V. Lavrov, B. Bech Nielsen, B. Hourahine, R. Jones, S. Öberg, and P. R. Briddon, "Weakly bound carbon-hydrogen complex in silicon," *Phys. Rev. B* **61**, p. 16659, 2000.
- [16] E. V. Lavrov, B. Bech Nielsen, J. R. Byberg, B. Hourahine, R. Jones, S. Öberg, and P. R. Briddon, "Local vibrational modes of two neighboring substitutional carbon atoms in silicon," *Phys. Rev. B* **62**, p. 158, 2000.
- [17] E. V. Lavrov, L. Hoffmann, B. Bech Nielsen, B. Hourahine, R. Jones, S. Öberg, and P. R. Briddon, "Combined infrared absorption and modelling study of a dicarbon-dihydrogen defect in silicon," *Phys. Rev. B* **62**, p. 12859, 2000.
- [18] E. V. Lavrov and J. Weber, "Evolution of hydrogen platelets in silicon determined by polarized Raman spectroscopy," *Phys. Rev. Lett.* **87**, p. 185502, 2001.
- [19] E. V. Lavrov and M. Fanciulli, "Interstitial carbon-substitutional tin center in silicon (?)," *Physica B* **302–303**, p. 263, 2001.
- [20] E. V. Lavrov, J. Weber, L. Huang, and B. Bech Nielsen, "Raman scattering study of vacancy-hydrogen related defects in silicon," *Physica B* **308–310**, p. 206, 2001.
- [21] E. V. Lavrov and J. Weber, "Structural properties of hydrogen-induced platelets in silicon: a Raman scattering study," *Physica B* **308–310**, p. 151, 2001.
- [22] E. V. Lavrov, M. Fanciulli, M. Kaukonen, R. Jones, and P. R. Briddon, "Carbon-tin defects in silicon," *Phys. Rev. B* **64**, p. 125212, 2001.
- [23] E. V. Lavrov, J. Weber, L. Huang, and B. Bech Nielsen, "Vacancy-hydrogen defects in silicon studied by Raman spectroscopy," *Phys. Rev. B* **64**, p. 035204, 2001.
- [24] E. V. Lavrov, J. Weber, F. Börrnert, C. G. Van de Walle, and R. Helbig, "Hydrogen-related defects in ZnO studied by infrared absorption spectroscopy," *Phys. Rev. B* **66**, p. 165205, 2002.
- [25] E. V. Lavrov and J. Weber, "Ortho and para interstitial H₂ in silicon," *Phys. Rev. Lett.* **89**, p. 215501, 2002.
- [26] E. V. Lavrov and J. Weber, "Ortho and para H₂ in silicon," *Physica B* **340–342**, p. 646, 2003.
- [27] E. V. Lavrov and J. Weber, "Hydrogen molecules in GaAs," *Physica B* **340–342**, p. 329, 2003.
- [28] E. V. Lavrov, "Infrared absorption spectroscopy of hydrogen-related defects in ZnO," *Physica B* **340–342**, p. 195, 2003.
- [29] E. V. Lavrov, "Raman scattering by hydrogen centers in silicon," *J. Comm. Tech. & Electronics* **49**, p. 479, 2004.
- [30] E. V. Lavrov, "Ortho and para state of interstitial H₂ in silicon and gallium arsenide," *Modern Phys. Lett. B* **18**, p. 453, 2004.
- [31] E. V. Lavrov, "Hydrogen in ZnO: an infra-red absorption study," in *Defects and diffusion in ceramics—an annual retrospective VI, Defect and diffusion forum* **226–228**, p. 181, Trans Tech Publications LTD, 2004.
- [32] E. V. Lavrov, F. Börrnert, and J. Weber, "Dominant hydrogen-oxygen complex in hydrothermally grown ZnO," *Phys. Rev. B* **71**, p. 035205, 2005.
- [33] M. Hiller, E. V. Lavrov, and J. Weber, "Hydrogen-induced platelets in Ge determined by Raman scattering," *Phys. Rev. B* **71**, p. 045208, 2005.

- [34] M. Hiller, E. V. Lavrov, J. Weber, B. Hourahine, R. Jones, and P. R. Briddon, "Interstitial H₂ in germanium by Raman scattering and *ab initio* calculations," *Phys. Rev. B* **72**, p. 153201, 2005.
- [35] E. V. Lavrov, F. Börrnert, and J. Weber, "Photoconductivity and infrared absorption study of hydrogen-related shallow donors in ZnO," *Phys. Rev. B* **72**, p. 085212, 2005.
- [36] J. Weber, T. Fischer, E. Hieckmann, M. Hiller, and E. V. Lavrov, "Properties of hydrogen induced voids in silicon," *J. Phys.–Condens. Mat.* **17**, p. 2303, 2005.
- [37] G. A. Shi, M. Stavola, S. J. Pearton, M. Thieme, E. V. Lavrov, and J. Weber, "Hydrogen local modes and shallow donors in ZnO," *Phys. Rev. B* **72**, p. 195211, 2005.
- [38] J. Weber, M. Hiller, and E. V. Lavrov, "Hydrogen in germanium," *Mat. Sci. Semicon. Proc.* **9**, p. 564, 2006.
- [39] E. V. Lavrov and J. Weber, "Effect of uniaxial stress on vibrational modes of hydrogen in ZnO," *Phys. Rev. B* **73**, p. 035208, 2006.
- [40] E. V. Lavrov, B. Börrnert, and J. Weber, "On the nature of hydrogen-related shallow donors in ZnO," *Physica B* **376–377**, p. 694, 2006.
- [41] M. Hiller, E. V. Lavrov, and J. Weber, "Raman spectroscopy of hydrogen molecules in germanium," *Physica B* **376–377**, p. 142, 2006.
- [42] E. V. Lavrov and J. Weber, "Uniaxial stress study of the Cu–H complex in ZnO," *Phys. Status Solidi B* **243**, p. 2657, 2006.
- [43] M. Hiller, E. V. Lavrov, and J. Weber, "Raman scattering study of H₂ in Si," *Phys. Rev. B* **74**, p. 235214, 2006.
- [44] M. Hiller, E. V. Lavrov, and J. Weber, "Ortho–para conversion of interstitial H₂ in Si," *Phys. Rev. Lett.* **98**, p. 55504, 2007.
- [45] F. Börrnert, E. V. Lavrov, and J. Weber, "Hydrogen motion in the Cu–H complex in ZnO," *Phys. Rev. B* **75**, p. 205202, 2007.
- [46] E. V. Lavrov, F. Börrnert, and J. Weber, "Hydrogen motion in ZnO," *Physica B* **401–402**, p. 366, 2007.
- [47] M. Hiller, E. V. Lavrov, and J. Weber, "A Raman scattering study of H₂ trapped near O in Si," *Physica B* **401–402**, p. 97, 2007.
- [48] J. Weber, M. Hiller, and E. V. Lavrov, "Hydrogen molecules in semiconductors," *Physica B* **401–402**, p. 91, 2007.
- [49] E. V. Lavrov, J. Weber, and F. Börrnert, "Copper dihydrogen complex in ZnO," *Phys. Rev. B* **77**, p. 155209, 2008.
- [50] E. V. Lavrov, F. Herklotz, and J. Weber, "Identification of two hydrogen donors in ZnO," *Phys. Rev. B* **79**, p. 165210, 2009.
- [51] E. V. Lavrov, F. Herklotz, and J. Weber, "Identification of hydrogen molecules in ZnO," *Phys. Rev. Lett.* **102**, p. 185502, 2009.
- [52] M. Hiller, E. V. Lavrov, and J. Weber, "Raman scattering study of H₂ trapped within {111}-oriented platelets in Si," *Phys. Rev. B* **80**, p. 045306, 2009.
- [53] E. V. Lavrov and J. Weber, "Comment on "Infrared absorption spectroscopy on OH–Ni complex in hydrothermally grown ZnO" [J. Appl. Phys. 105, 093516 (2009)]," *J. Appl. Phys.* **106**, p. 086104, 2009.

- [54] F. Herklotz, E. V. Lavrov, and J. Weber, "Photoluminescence study of hydrogen donors in ZnO," *Physica B* **404**, p. 4349, 2009.
- [55] E. V. Lavrov, "Hydrogen in ZnO," *Physica B* **404**, p. 5075, 2009.
- [56] E. V. Lavrov, M. Hiller, and J. Weber, "Raman scattering on H₂ in platelets in silicon," *Physica B* **404**, p. 5085, 2009.
- [57] F. Herklotz, E. V. Lavrov, and J. Weber, "On diffusion of Cu in ZnO," *Physica B* **404**, p. 4807, 2009.
- [58] F. Herklotz, E. V. Lavrov, Vl. Kolkovsky, J. Weber, and M. Stavola, "Charge states of a hydrogen defect with a local vibrational mode at 3326 cm⁻¹ in ZnO," *Phys. Rev. B* **82**, p. 115206, 2010.
- [59] Vl. Kolkovsky, L. Scheffler, E. Hieckmann, E. V. Lavrov, and J. Weber, "Schottky contacts on differently grown *n*-type ZnO single crystals," *Appl. Phys. Lett.* **98**, p. 082104, 2011.
- [60] F. Herklotz, E. V. Lavrov, J. Weber, G. V. Mamin, Y. S. Kutin, M. A. Volodin, and S. B. Orlinskii, "Identification of shallow Al donors in ZnO," *Phys. Status Solidi B* **248**, p. 1532, 2011.
- [61] F. Herklotz, E. V. Lavrov, and J. Weber, "Infrared absorption of the hydrogen donor in rutile TiO₂," *Phys. Rev. B* **83**, p. 235202, 2011.
- [62] D. Bastin, E. V. Lavrov, and J. Weber, "Metastable state of the V_{Zn}H₂ defect in ZnO," *Phys. Rev. B* **83**, p. 195210, 2011.
- [63] S. Koch, E. V. Lavrov, and J. Weber, "Rovibrational states of interstitial H₂ in Si," *Phys. Rev. B* **83**, p. 233203, 2011.
- [64] L. Scheffler, Vl. Kolkovsky, E. V. Lavrov, and J. Weber, "Deep level transient spectroscopy studies of *n*-type ZnO single crystals grown by different techniques," *J. Phys.-Condens. Mat.* **23**, p. 334208, 2011.
- [65] E. V. Lavrov, D. Bastin, J. Weber, J. Schneider, A. Fauler, and M. Fiederle, "Reassignment of the O_{Te}-V_{Cd} complex in CdTe," *Phys. Rev. B* **84**, p. 233201, 2011.
- [66] J. Weber, E. V. Lavrov, and F. Herklotz, "Hydrogen shallow donors in ZnO and rutile TiO₂," *Physica B* **407**, p. 1456, 2012.
- [67] S. G. Koch, E. V. Lavrov, and J. Weber, "Photoconductive detection of tetrahedrally coordinated hydrogen in ZnO," *Phys. Rev. Lett.* **108**, p. 165501, 2012.
- [68] D. Bastin, E. V. Lavrov, and J. Weber, "Cadmium vacancy passivated by two hydrogen atoms in CdSe," *Phys. Rev. B* **85**, p. 195204, 2012.
- [69] F. Herklotz, E. V. Lavrov, and J. Weber, "Charge states of a hydrogen defect (3326 cm⁻¹ line) in ZnO," *Physica B* **407**, p. 2883, 2012.
- [70] D. Bastin, E. V. Lavrov, and J. Weber, "Identification of a metastable state of the V_{Zn}H₂ defect in ZnO," *Physica B* **407**, p. 2919, 2012.
- [71] S. Koch, E. V. Lavrov, and J. Weber, "Raman investigation of ro-vibrational modes of interstitial H₂ in Si," *Physica B* **407**, p. 2978, 2012.
- [72] S. Socher, E. V. Lavrov, and J. Weber, "Hydrogen-induced defects in ion-implanted Si," *Phys. Rev. B* **86**, p. 125205, 2012.
- [73] S. N. Yurchenko, B. Assfour, E. V. Lavrov, and G. Seifert, "Combined IR absorption and modeling study of nanoporous zeolite imidazolate frameworks (ZIFs) filled with hydrogen," *RSC Advances* **2**, p. 9839, 2012.

- [74] S. Socher, E. V. Lavrov, and J. Weber, "Raman scattering study on hydrogen-induced defects in silicon used in the ion-cut process," *Phys. Status Solidi C* **9**, p. 2013, 2012.
- [75] E. V. Lavrov, F. Herklotz, and Y. S. Kutin, "Effect of uniaxial stress on substitutional Ni in ZnO," *Solid State Commun.* **159**, p. 36, 2013.
- [76] D. Bastin, E. V. Lavrov, and J. Weber, "Reassignment of the $O_{Se}-V_{Cd}$ complex in CdSe," *AIP Conference Proceedings* **1583**, p. 169, 2014.
- [77] S. G. Koch, E. V. Lavrov, and J. Weber, "Confirmation of freely rotating H_2 in ZnO," *AIP Conference Proceedings* **1583**, p. 345, 2014.
- [78] E. V. Lavrov, F. Herklotz, and Y. S. Kutin, "Piezospectroscopic study of substitutional Ni in ZnO," *AIP Conference Proceedings* **1583**, p. 350, 2014.
- [79] S. G. Koch, E. V. Lavrov, and J. Weber, "Interplay between interstitial and substitutional hydrogen donors in ZnO," *Phys. Rev. B* **89**, p. 235203, 2014.
- [80] S. G. Koch, E. V. Lavrov, and J. Weber, "Towards understanding the hydrogen molecule in ZnO," *Phys. Rev. B* **90**, p. 205212, 2014.
- [81] E. V. Lavrov, F. Herklotz, and J. Weber, "Fano resonances in photoconductivity spectra of hydrogen donors in ZnO and rutile," *Semicond. Sci. Technol.* **30**, p. 024004, 2015.
- [82] E. V. Lavrov, "Infrared absorption on hydrogen in anatase TiO_2 ," *Phys. Status Solidi A* **212**, p. 1494, 2015.
- [83] F. Herklotz, A. Hupfer, K. M. Johansen, B. G. Svensson, S. G. Koch, and E. V. Lavrov, "Infrared absorption on a complex comprising three equivalent hydrogen atoms in ZnO," *Phys. Rev. B* **92**, p. 155203, 2015.
- [84] E. V. Lavrov, "Hydrogen donor in anatase TiO_2 ," *Phys. Rev. B* **93**, p. 045204, 2016.
- [85] E. V. Lavrov, T. Mchedlidze, and F. Herklotz, "Photoconductive detection of hydrogen in ZnO and rutile TiO_2 ," *J. Appl. Phys.* **120**, p. 055703, 2016.
- [86] В. В. Мельников and Э. В. Лавров, "О механизме орто-пара конверсии молекулярного водорода в полупроводниках," *Известия вузов. Физика* **59**, p. 166, 2016.
- [87] E. V. Lavrov, I. Chaplygin, and T. Mchedlidze, "Photoconductivity as a method to probe defects in ultra thin Si films," *Appl. Phys. Lett.* **110**, p. 132102, 2017.
- [88] V. V. Melnikov and E. V. Lavrov, "On the mechanism of ortho-para conversion of molecular hydrogen in semiconductors," *Russ. Phys. J.* **59**, p. 2168, 2017.
- [89] A. J. Hupfer, E. V. Monakhov, B. G. Svensson, I. Chaplygin, and E. V. Lavrov, "Hydrogen motion in rutile TiO_2 ," *Sci. Rep.* **7**, p. 17065, 2017.
- [90] V. V. Melnikov, M. Hiller, and E. V. Lavrov, "Two-dimensional H_2 in Si: Raman scattering and modeling study," *Phys. Rev. B* **97**, p. 125307, 2018.
- [91] F. Herklotz, I. Chaplygin, and E. V. Lavrov, "On the method of photoconductive detection of defects in semiconductors by vibrational mode-related Fano resonances," *J. Appl. Phys.* **124**, p. 025704, 2018.
- [92] I. Chaplygin, F. Herklotz, and E. V. Lavrov, "Reorientation kinetics of hydroxyl groups in anatase TiO_2 ," *J. Chem. Phys.* **149**, p. 044507, 2018.
- [93] E. V. Lavrov, "Comment on "Structural, electronic, and optical properties of the C-C complex in bulk silicon from first principles" [J. Appl. Phys. 123, 161421 (2018)]," *J. Appl. Phys.* **124**, p. 086101, 2018.

- [94] F. Herklotz, I. Chaplygin, E. V. Lavrov, A. Neiman, R. J. Reeves, and M. W. Allen, "Bistability of a hydrogen defect with a vibrational mode at 3326 cm^{-1} in ZnO," *Phys. Rev. B* **99**, p. 115203, 2019.
- [95] F. Herklotz, I. Chaplygin, E. V. Lavrov, and V. F. Agekyan, "Photoconductive detection of a hydrogen-related donor in SnO₂," *Appl. Phys. Lett.* **114**, p. 152103, 2019.
- [96] E. V. Lavrov, I. Chaplygin, and F. Herklotz, "Infrared absorption study of a dihydrogen complex in anatase TiO₂," *Phys. Status Solidi B* **257**, p. 1900779, 2020.
- [97] F. Herklotz, E. V. Lavrov, and V. V. Melnikov, "Substitutional Sulfur in CdSe: Localized Vibrational Modes," *Phys. Status Solidi B* **257**, p. 2000204, 2020.
- [98] E. V. Lavrov, V. V. Melnikov, and N. V. Abrosimov, "Interstitial H₂ in ²⁹Si," *Phys. Rev. B* **103**, p. 205204, 2021.
- [99] F. Herklotz, E. V. Lavrov, and V. V. Melnikov, "SO₄^{*} complex in CdTe: Infrared absorption spectroscopy and first-principles calculations," *Phys. Rev. B* **104**, p. 035204, 2021.
- [100] E. V. Lavrov, I. Chaplygin, F. Herklotz, and V. V. Melnikov, "Hydrogen donors in anatase TiO₂," *Phys. Status Solidi B* **258**, p. 2100171, 2021.
- [101] E. V. Lavrov, I. Chaplygin, F. Herklotz, V. V. Melnikov, Y. Kutin, and L. Vines, "Dominant hydrogen complex in natural anatase TiO₂," *J. Appl. Phys.* **130**, p. 145701, 2021.
- [102] F. Herklotz, S. Thiede, and E. Lavrov, "Vibrational signatures of substitutional oxygen in CdTe and CdSe," *Phys. Status Solidi B* **258**, p. 2100203, 2021.
- [103] E. V. Lavrov, I. Chaplygin, F. Herklotz, V. V. Melnikov, and Y. Kutin, "Hydrogen in single-crystalline anatase TiO₂," *J. Appl. Phys.* **131**, p. 030902, 2022.
- [104] F. Herklotz, E. V. Lavrov, and V. V. Melnikov, "SO₄^{*} in cadmium chalcogenides: CdSe versus CdTe," *Phys. Status Solidi B* **259**, p. 2200029, 2022.
- [105] F. Herklotz, E. V. Lavrov, T. D. C. Hobson, J. D. Major, and K. Durose, "Oxygen in antimony triselenide: An IR absorption study," *Appl. Phys. Lett.* **120**, p. 212101, 2022.
- [106] E. V. Lavrov, "Subthreshold photodissociation of H₂ in silicon," *Phys. Rev. A* **106**, p. 013116, 2022.
- [107] F. Herklotz, E. V. Lavrov, V. V. Melnikov, Z. Galazka, and V. F. Agekyan, "Comprehensive study of the interstitial hydrogen donor in SnO₂," *Phys. Rev. B* **108**, p. 205204, 2023.