

Full list of publications, Pekka Laukkanen

1. Refereed scientific articles

- (1) A. Rinta-Möykky, P. Laukkanen, S. Lehkonen, J. Dekker, A. Tukiainen, P. Uusimaa, and M. Pessa: Plasma-assisted MBE growth of GaN on HVPE-GaN substrates. *Physica Status Solidi*, Vol. 176 (1999) 465.
- (2) W. Li, T. Jouhti, C.S. Peng, J. Konttinen, P. Laukkanen, E.-M. Pavelescu, M. Dumitrescu, and M. Pessa: Low threshold current 1.32 μm GaInNAs / GaAs single quantum well lasers grown by molecular beam epitaxy. *Applied Physics Letters*, Vol. 79 (2001) 3386.
- (3) P. Laukkanen, S. Lehkonen, P. Uusimaa, M. Pessa, A. Seppälä, T. Ahlgren, and E. Rauhala: Emission studies of InGaN layers and LEDs grown by plasma-assisted MBE. *Journal of Crystal Growth*, Vol. 230 (2001) 503.
- (4) C.S. Peng, T. Jouhti, P. Laukkanen, E.-M. Pavelescu, J. Konttinen, W. Li, and M. Pessa: 1.32 μm GaInNAs / GaAs laser with a low threshold current density. *IEEE Photonics Technology Letters*, Vol. 14 (2002) 275.
- (5) E.-M. Pavelescu, T. Jouhti, C.S. Peng, W. Li, J. Konttinen, M. Dumitrescu, P. Laukkanen, and M. Pessa: Enhanced optical and structural properties of strain-compensated 1.3 μm GaInNAs / GaNAs / GaAs quantum well laser structures. *Journal of Crystal Growth*, Vol. 241 (2002) 31.
- (6) P. Laukkanen, S. Lehkonen, P. Uusimaa, M. Pessa, J. Oila, S. Hautakangas, K. Saarinen, J. Likonen, and J. Keränen: Structural, electrical, and optical properties of defects in Si-doped GaN grown by molecular-beam epitaxy on hydride vapor phase epitaxy GaN on sapphire. *Journal of Applied Physics*, Vol. 92 (2002) 786.
- (7) M. Kuzmin, P. Laukkanen, R.-L. Vanne, and I.J. Väyrynen: An effect of vicinal surface morphology on adsorbate structure: Yb growth on $[11\bar{2}]$ -tilt Si(111). *Surface Science*, Vol. 515 (2002) 471.
- (8) A. Bernas, P. Laukkanen, N. Kumar, P. Mäki-Arvela, J. Väyrynen, E. Laine, B. Holmbom, T. Salmi, and D.Y. Murzin: A new heterogeneously catalytic pathway for isomerization of linoleic acid over Ru/C and Ni/H-MCM-41 catalysts. *Journal of Catalysis*, Vol. 210 (2002) 354.
- (9) P. Laukkanen, M. Kuzmin, R.E. Perälä, R.-L. Vaara, and I.J. Väyrynen: Scanning tunneling microscopy study of GaAs(100) surface prepared by HCl-isopropanol treatment. *Applied Surface Science*, Vol. 206 (2003) 2.
- (10) S. Kallip, P. Laukkanen, A. Jänes, V. Sammelselg, I.J. Väyrynen, P. Miidla, and E. Lust: Investigation of the surface topography and double layer characteristics of variously pre-treated

antimony single crystal electrodes.

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(11) R.-L. Vaara, M. Kuzmin, R.E. Perälä, P. Laukkanen, and I.J. Väyrynen: Formation and thermal-desorption-controlled patterning of Yb-induced structures on vicinal Si(111)[112]-miscut surface. Surface Science Letters, Vol. 529 (2003) L229.

(12) M. Kuzmin, R.E. Perälä, P. Laukkanen, R.-L. Vaara, M.A. Mittsev, and I.J. Väyrynen: Initial stages of Yb/Si(100) interface growth: 2x3 and 2x6 reconstructions. Applied Surface Science, Vol. 214 (2003) 196.

(13) M. Kuzmin, R.-L. Vaara, P. Laukkanen, R.E. Perälä, and I.J. Väyrynen: Yb, Eu, and (Yb+Eu)-stabilized 3x1 and 3x2 reconstructions on Si(111). Surface Science, Vol. 538 (2003) 124.

(14) R.-L. Vaara, M. Kuzmin, R.E. Perälä, P. Laukkanen, and I.J. Väyrynen: Evolution of step and terrace structure on [112]-miscut Si(111) surfaces upon formation of triple- and single-domain Yb-induced 3x2 reconstruction. Surface Science, Vol. 539 (2003) 72.

(15) J. Hajek, N. Kumar, P. Mäki-Arvela, T. Salmi, D.Y. Murzin, I. Paseka, T. Heikkilä, E. Laine, P. Laukkanen, and J. Väyrynen: Ruthenium-modified MCM-41 mesoporous molecular sieve and Y zeolite catalysts for selective hydrogenation of cinnamaldehyde. Applied Catalysis A, Vol. 251 (2003) 385.

(16) R.-L. Vaara, M. Kuzmin, P. Laukkanen, R.E. Perälä, and I.J. Väyrynen: Two series of triple- and single-domain reconstructions induced by europium on vicinal Si(111)[112]-miscut surface. Applied Surface Science, Vol. 220 (2003) 327.

(17) M. Kuzmin, P. Laukkanen, R.E. Perälä, R.-L. Vaara, and I.J. Väyrynen: Formation of ytterbium silicide nanowires on Si(001). Applied Surface Science, Vol. 222 (2003) 394.

(18) M. Kuzmin, R.E. Perälä, R.-L. Vaara, P. Laukkanen, and I.J. Väyrynen: Formation of ytterbium silicide film on Si(001) by solid phase epitaxy. Journal of Crystal Growth, Vol. 262 (2004) 231.

(19) A. Bernas, N. Kumar, P. Laukkanen, J. Väyrynen, T. Salmi, and D.Y. Murzin: Influence of Ruthenium Precursor on the Catalytic Activity of Ru/Al₂O₃ in Selective Isomerization of Linoleic Acid to cis-9, trans-11- and trans-10, cis-12-Conjugated Linoleic Acid. Applied Catalysis A, Vol. 267 (2004) 121.

(20) M. Kuzmin, R.-L. Vaara, P. Laukkanen, R.E. Perälä, and I.J. Väyrynen: Structural and statistical analysis of Yb/Si(111) and Eu/Si(111) reconstructions. Surface Science, Vol. 549 (2004) 183.

(21) P. Laukkanen, R.E. Perälä, R.-L. Vaara, I.J. Väyrynen, M. Kuzmin, and J. Sadowski: Electronic and

structural analysis of Sb-induced GaAs(100)(2x4) and (2x8) surfaces.
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(22) N. Kumar, P. Mäki-Arvela, J. Hajek, T. Salmi, D.Y. Murzin, T. Heikkilä, E. Laine, P. Laukkanen, and J. Väyrynen: Physico-chemical and catalytic properties of Ru-MCM-41 mesoporous molecular sieve catalyst: influence of Ru modification methods.
Microporous and Mesoporous Materials, Vol. 69 (2004) 173.

(23) M. Kuzmin, P. Laukkanen, R.E. Perälä, R.-L. Vaara, and I.J. Väyrynen: Atomic structure of the Eu/Si(111) 3x2, 5x1, and 7x1 surfaces studied by photoelectron spectroscopy.
Physical Review B, Vol. 71 (2005) 155334.

(24) P. Laukkanen, M. Kuzmin, R.E. Perälä, M. Ahola, S. Mattila, I.J. Väyrynen, J. Sadowski, J. Konttinen, T. Jouhti, C. Peng, M. Saarinen, and M. Pessa: Electronic and structural properties of GaAs(100)(2x4) and InAs(100)(2x4) surfaces studied by core-level photoemission and scanning tunneling microscopy.
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(25) M. Kuzmin, R.E. Perälä, P. Laukkanen, and I.J. Väyrynen: Atomic geometry and electronic structure of the Si(100)-2x3-Eu surface phase.
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(27) R.E. Perälä, M. Kuzmin, P. Laukkanen, R.-L. Vaara, and I.J. Väyrynen: Eu- and Yb-induced reconstructions on vicinal Si(100) surface.
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(28) P. Laukkanen, M. Ahola, M. Kuzmin, R.E. Perälä, I.J. Väyrynen, and J. Sadowski: Bi-induced (2x6), (2x8), and (2x4) reconstructions on the InAs(100) surface.
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(29) M. Kuzmin, P. Laukkanen, R.E. Perälä, and I.J. Väyrynen: Scanning tunneling microscopy study of the Eu-induced Ge(111)-(3x2)/(3x4) reconstruction.
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(30) M. Ahola, P. Laukkanen, R.E. Perälä, M. Kuzmin, I.J. Väyrynen, J. Pakarinen, and M. Adell: Structural properties of Bi-terminated GaAs(001) surface.
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- (33) S. Majumdar, H.S. Majumdar, P. Laukkanen, I.J. Väyrynen, R. Laiho, and R. Österbacka: Application of regioregular polythiophene in spintronic devices: Effect of interface. *Applied Physics Letters*, Vol. 89 (2006) 122114.
- (34) P. Laukkanen, J. Pakarinen, M. Ahola-Tuomi, M. Kuzmin, R.E. Perälä, I.J. Väyrynen, A. Tukiainen, J. Konttinen, P. Tuomisto, and M. Pessa: Structural and electronic properties of Bi-adsorbate-stabilized reconstructions on the InP(100) and GaAsN(100) surfaces. *Physical Review B*, Vol. 74 (2006) 155302.
- (35) P. Laukkanen, M. Ahola-Tuomi, M. Kuzmin, R.E. Perälä, I.J. Väyrynen, A. Tukiainen, J. Pakarinen, M. Saarinen, and M. Pessa: Structural properties of Bi-stabilized reconstructions of GaInAs(100) surface. *Applied Physics Letters*, Vol. 90 (2007) 082101.
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- (37) M. Kuzmin, P. Laukkanen, R.E. Perälä, M. Ahola-Tuomi, and I.J. Väyrynen: High-resolution core-level photoemission study of Ge(111) 2×1 -Sb and Ge(111) $(\sqrt{3} \times \sqrt{3})R30^\circ$ -Bi reconstructions. *Journal of Electron Spectroscopy and Related Phenomena*, Vol. 159 (2007) 24.
- (38) M. Kuzmin, K. Schulte, P. Laukkanen, M. Ahola-Tuomi, R.E. Perälä, M. Adell, T. Balasubramanian, and I.J. Väyrynen: Atomic and electronic structure of the Yb/Ge(111)- (3×2) surface studied by high-resolution photoelectron spectroscopy. *Physical Review B*, Vol. 75 (2007) 165305.
- (39) P. Laukkanen, M. Ahola-Tuomi, J. Adell, M. Adell, K. Schulte, M. Kuzmin, M.P.J. Punkkinen, J. Pakarinen, A. Tukiainen, R.E. Perälä, I.J. Väyrynen, and M. Pessa: A comparative study of clean and Bi-stabilized InP(100) (2×4) surfaces by the core-level photoelectron spectroscopy. *Surface Science*, Vol. 601 (2007) 3395.
- (40) M.P.J. Punkkinen, P. Laukkanen, K. Kokko, M. Ropo, M. Ahola-Tuomi, I.J. Väyrynen, H.-P. Komsa, T.T. Rantala, M. Pessa, M. Kuzmin, L. Vitos, J. Kollár, and B. Johansson: Surface core-level shifts of GaAs(100) (2×4) from first principles. *Physical Review B*, Vol. 76 (2007) 115334.
- (41) K. Kokko, M. Ropo, M.P.J. Punkkinen, P. Laukkanen, M. Alatalo, L. Vitos, J. Kollar, and B. Johansson: Surface core-level shift of Pd at the AgPd $1-c$ (111) surface: Nonlinear subsurface effects. *Surface Science*, Vol. 601 (2007) 5419.

- (42) M. Ahola-Tuomi, P. Laukkanen, M.P.J. Punkkinen, R.E. Perälä, I.J. Väyrynen, M. Kuzmin, K. Schulte, and M. Pessa: Formation of an ordered pattern of Bi nanolines on InAs(100) by self-assembly.
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- (44) J. Pakarinen, C.S. Peng, J. Puustinen, P. Laukkanen, A. Tukiainen, V.-M. Korpijärvi, and M. Pessa: Post-annealing of InGaAs / GaAs and InGaAsN / GaAs triple quantum-well structures with a modified proximity GaAs cap: A dramatic effect on the optical and structural properties.
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- (45) M.P.J. Punkkinen, K. Kokko, L. Vitos, P. Laukkanen, E. Airiskallio, M. Ropo, M. Ahola-Tuomi, M. Kuzmin, I.J. Väyrynen, and B. Johansson: Surface core-level shifts within complete screening: problems with pseudohydrogenated slabs.
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- (47) J. Pakarinen, C.S. Peng, V. Polojärvi, A. Tukiainen, V.-M. Korpijärvi, J. Puustinen, M. Pessa, P. Laukkanen, J. Likonen, and E. Arola: Suppression of annealing-induced In diffusion in Be-doped GaInNAs / GaAs quantum wells.
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- (48) J. Pakarinen, V. Polojärvi, P. Laukkanen, A. Tukiainen, A. Laakso, C.S. Peng, P. Tuomisto, V.-M. Korpijärvi, J. Puustinen, and M. Pessa: A comparative study of the effect of applied As flux on the growth of GaAs / AlAs quantum wells.
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- (58) J.J.K. Lång, M.P.J. Punkkinen, P. Laukkanen, M. Kuzmin, V. Tuominen, M. Pessa, M. Guina, I.J. Väyrynen, K. Kokko, B. Johansson, and L. Vitos: Ab initio and scanning tunneling microscopy study of indium-terminated GaAs(100) surface: An indium-induced surface reconstruction change in the c(8x2) structure.
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- (62) T. Salminen, M. Hahtala, I. Seppälä, P. Laukkanen, and T. Niemi: Picosecond pulse laser ablation of yttria-stabilized zirconia from kilohertz to megahertz repetition rate. *Applied Physics A*, Vol. 101 (2010) 735.
- (63) L. Toikkanen, T. Hakkarainen, A. Schramm, A. Tukiainen, P. Laukkanen, and M. Guina: Metamorphic growth of tensile strained GaInP on GaAs substrate. *Journal of Crystal Growth*, Vol. 312 (2010) 3105.
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3. Theses

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Publications intended for professional community

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5. Textbooks

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6. Patents

(1) Patent family related to crystalline oxidation of III-V surfaces: FI20106181 "Method for treating a substrate and a substrate" includes: WO2012062966 (A1), US2016049295 (A1), US2013214331 (A1), US9269763 (B2), RU2013126686 (A), RU2576547 (C2), NZ609295 (A), KR20130124493 (A), JP2014502042 (A), EP2638565 (A1), CN103201827 (A), CA2814856 (A1), AU2011327960 (A1),

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(2) Patent family related to SiO₂-Ge interface: "MANUFACTURING OF FOREIGN OXIDE ON SEMICONDUCTOR". Finnish priority application FI20155284 filed 16.04.2015, FI patent 127415 granted; PCT application PCT/FI2016/050101 filed 2/2016; National phase coverage: TW, US (div US), EP, CN(HK), KR, JP.

(3) Patent family related to oxidation of silicon surfaces: "SILICON-ON-INSULATOR WITH CRYSTALLINE SILICON OXIDE". Finnish priority application FI20175587 filed 21.06.2017; FI patent 128442 granted; PCT application; PCT/FI2018/050409 filed 6/2018.

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(5) Patent family related to low-temperature oxidation of Si-based materials: "SEMICONDUCTOR STRUCTURE AND METHOD". Finnish priority application 20195341 filed 26.04.2019; FI patent 128462 granted; PCT application PCT/FI2020/050265 filed 4/2020; PCT and TW applications were filed 4/2020, National phase 10/2021.

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