High-Speed Electron Devices Using Advanced Structures and Materials

（浅田研究室）

Journal Papers

1. S. Suzuki, M. Shiraishi, H. Shibayama, and M. Asada, “High-Power Operation of Terahertz Oscillators with Resonant Tunneling Diodes Using Impedance-Matched Antennas and Array Configuration”, IEEE J. Selected Topics Quantum Electron., vol. 19, no. 1, 8500108, Feb. 2013. (DOI: 10.1109/JSTQE.2012.2215017)
2. H. Kanaya, S. Suzuki, and M. Asada, „Terahertz Oscillation of Resonant Tunneling Diodes with Deep and Thin Quantum Wells”, Electron. Express, vol.10, pp.1-7, 2013. (DOI: 10.1587/elex.10.20130501)
3. M. Asada, H. Kanaya, and S. Suzuki, “Terahertz Emission from Resonant Tunneling Diodes without Satisfying Oscillation Condition”, Jpn. J. Appl. Phys. vol.52, 100210(1-4), 2013. (DOI: 10.7567/JJAP.52.100210)
4. H. Kanaya, R. Sogabe, T. Maekawa, S. Suzuki, and M. Asada, “Fundamental Oscillation up to 1.42 THz in Resonant Tunneling Diodes by Optimized Collector Spacer Thickness”, J. Infrared, Millimeter and Terahertz Waves, vol. 35, pp.425-431, 2014. (DOI: 10.1007/s10762-014-0058-z)
5. S. Kitagawa, S. Suzuki, and M. Asada, ” Wide-Range Varactor-Tuned Terahertz Oscillator Using Resonant Tunneling Diode”, J. Infrared, Millimeter and Terahertz Waves, vol. 35, pp. 445-450, 2014. (DOI: 10.1007/s10762-014-0061-4)
6. H. Sugiyama, A. Teranishi, S. Suzuki, and M. Asada, “Structural and electrical transport properties of MOVPE-grown pseudomorphic AlAs/InGaAs/InAs resonant tunneling diodes on InP substrates”, Jpn. J. Appl. Phys. vol. 53, 031202(1-6), 2014. (DOI:10.7567/JJAP.53.031202)

International Conferences

1. M. Asada and S. Suzuki, “Room-Temperature THz Oscillators using Resonant Tunneling Diodes”, Int. Workshop. Optical THz Science and Tech. (OTST2013), Tu1-2, Kyoto, Apr. 2, 2013 (Invited).
2. M. Asada and S. Suzuki, “Room-Temperature THz Oscillators Using Resonant

Tunneling Diodes", Int. Symp. Microwave/Terahertz Science and Application (MTSA 2013), Session 1, Shanghai, July 22, 2013 (Invited).

3. M. Asada and S. Suzuki, "Room-Temperature Terahertz Oscillation of Resonant Tunneling Diodes", SPIE Int. Symp. Optics and Photonics, Terahertz Emitters, Receivers, and Applications IV, No.8846-11, San Diego, Aug. 25, 2013 (Invited).
4. M. Asada and S. Suzuki, "Compact THz Oscillators with Resonant Tunneling Diodes and Application to High-Capacity Wireless Communications", Int. Conf. on Applied Electromagnetics and Communications, Special Session on THz, Dubrovnik (Croatia), Oct. 16, 2013 (Invited).
5. M. Asada and S. Suzuki, "Resonant Tunneling Diodes for Room- Temperature Terahertz Oscillators", Asia Pacific Microwave Conf. (APMC2013), T3A-1, Seoul, Nov. 7, 2013 (Invited).
6. R. Sogabe, K. Shizuno, H. Kanaya, S. Suzuki, M. Asada, H. Sugiyama, and H. Yokoyama, "Terahertz Oscillators using Resonant Tunneling Diodes with InAlGaAs/InP Composite Collector", Int. Conf. Indium Phosphide and Related Materials (IPRM2013), MoPI-24, Kobe, May 20, 2013.
7. K. Minoguchi, K. Okada, S. Suzuki, and M. Asada, "Proposal and Fabrication of Resonant-Tunneling-Diode Terahertz Oscillator with Structure for High Frequency Modulation", Int. Conf. Infrared, Millimeter, and THz Waves (IRMMW2013), Mainz (Germany), ThP3-59, Sept. 5, 2013.
8. M. Asada, H. Kanaya, and S. Suzuki,"Spontaneous Emission of Terahertz Waves from Resonant Tunneling Diodes", International Symposium on Advanced Nanodevices and Nanotechnology (ISANN2013), Kauai(USA), PII-14, Dec. 11, 2013.
9. K. Okada, S. Suzuki, and M. Asada, "Terahertz Oscillating Resonant Tunneling Diode with Slot-Fed Patch Antenna", Int. Symp. Terahertz Nanoscience, No.5, Osaka, March 14, 2014.
10. S. Suzuki and M. Asada, "Room-temperature THz Oscillators with Resonant Tunneling Diodes", Symposium on Communication, Microelectronics, Optoelectronics, and Sensors Emerging Technologies Research, Grenoble, July 7, 2014 (Invited, to be presented).
11. S. Suzuki and M. Asada, "Room-Temperature Resonant-Tunneling-Diode Terahertz Oscillator", Int. Conf. Solid State Device and Materials (SSDM2014), Tsukuba, Aug. 2014 (invited, to be presented).
12. K. Okada, S. Suzuki, and M. Asada, "Resonant-Tunneling-Diode Terahertz Oscillator Integrated with Slot-Coupled Patch Antenna", Int. Conf. Indium

Phosphide and Related Materials (IPRM2014), Montpellier (France), May 2014 (to be presented).

13. H. Kanaya, R. Sogabe, T. Maekawa, S. Suzuki, and M. Asada, “Frequency Increase in Resonant Tunneling-Diode Terahertz Oscillators Using Optimum Collector Spacer”, Int. Conf. Indium Phosphide and Related Materials (IPRM2014), Montpellier (France), May 2014 (to be presented).

Domestic Conferences

1. 金谷英敏，柴山裕孝，鈴木左文，浅田雅洋，「電子の遅延時間短縮による共鳴トンネルダイオードのテラヘルツ発振周波数上昇」，応用物理学会講演会，28p-D1-10，厚木，2013 年 3 月 28 日．（招待講演）
   H. Kanaya, H. Shibayama, S. Suzuki, and M. Asada, ”Frequency Increase in Terahertz Oscillation of Resonant Tunneling Diodes by Reduced Electron Delay Time”, Nat. Conv. Rec., JSAP, 28p-D1-10, Atsugi, Mar. 28, 2013. (Invited)
2. 曽我部陸，静野薫，金谷英敏，鈴木左文，浅田雅洋，杉山弘樹，横山春喜，「InAlGaAs/InP コンポジットコレクタを持つ共鳴トンネルダイオードを用いたテラヘルツ発振素子」，応用物理学会講演会，30a-PA3-9，厚木，2013 年 3 月 30 日．
   R. Sogabe, K. Shizuno, H. Kanaya, S. Suzuki, M. Asada, H. Sugiyama, and H. Yokoyama, ” Terahertz Oscillator using Resonant Tunneling Diodes with InAlGaAs/InP composite collector”, Nat. Conv. Rec., JSAP, 30a-PA3-9, Atsugi, Mar. 30, 2013.
3. 岡田健吾，鈴木左文，浅田雅洋，池田 悠，「高周波変調用共鳴トンネルダイオードテラヘルツ発振素子」，応用物理学会講演会，17a-A14-10，京都，2013 年 9 月 17 日．
   K. Okada, S. Suzuki, M. Asada, and Y. Ikeda, “Terahertz-Oscillating Resonant Tunneling Diodes with Structure for High Frequency Modulation”, Nat. Conv. Rec., JSAP, 17a-A14-10, Kyoto, Sept. 17, 2013.
4. 金谷英敏，曽我部 陸，鈴木左文，浅田雅洋，「ステップエミッタ構造により低電圧化された共鳴トンネルダイオードのテラヘルツ発振」，応用物理学会講演会，17p-A14-10，京都，2013 年 9 月 17 日．
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5. 宮島 悠, 忽滑谷拓郎, 鈴木左文, 「短チャネル HEMT を用いたボウタイアンテナ集積テラヘルツ受信素子」, 応用物理学会講演会, 17p-E17-6**,** 相模原, 2014 年 3 月 17 日.
   Y. Miyajima, T. Nukariya, and S. Suzuki, “Terahertz Detector Using Short Channel HEMT with Bow-Tie Antenna”, Nat. Conv. Rec., JSAP, 17p-E17-6, Sagamihara, Mar. 17, 2014.
6. 金谷英敏, 曽我部 陸, 前川 猛, 鈴木左文, 浅田雅洋, 「スペーサ層厚最適化による共鳴トンネルダイオードテラヘルツ発振素子の発振周波数向上」, 応用物理学会講演会, 17p-E17-8, 相模原, 2014 年 3 月 17 日.
   H. Kanaya, R. Sogabe, T. Maekawa, S. Suzuki, and M. Asada, ”Frequency Increase in Resonant-Tunneling-Diode Terahertz Oscillators by Optimized Collector Spacer Thickness”, Nat. Conv. Rec., JSAP, 17p-E17-8, Sagamihara, Mar. 17, 2014.
7. 岡田健吾, 鈴木左文, 浅田雅洋, 「スロット結合型パッチアンテナを集積した共鳴トンネルダイオードテラヘルツ発振器」, 応用物理学会講演会, 17p-E17-9, 相模原, 2014 年 3 月 17 日.
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8. 池田 悠, 岡田健吾, 鈴木左文, 浅田雅洋, 「大容量テラヘルツ無線通信のための高速変調可能な共鳴トンネルダイオード発振器」, 電子情報通信学会全国大会, C-14-20, 新潟, 2014 年 3 月 20 日.
   Y. Ikeda, K. Okada, S. Suzuki, and M. Asada, ”Resonant-tunneling-diode oscillator with high-frequency modulation structure for high-capacity wireless terahertz communication”, Nat. Conv. Rec., IEICE, C-14-20, Niigata, Mar. 20, 2014.
9. 鈴木左文, 浅田雅洋, 「共鳴トンネルダイオードテラヘルツ発振器の進展と分析応用への展開」, 電子情報通信学会全国大会, CI-3-5, 新潟, 2014 年 3 月 18 日. (招待講演)
   S. Suzuki and M. Asada, ”Recent Progress and Future Development for Sensing Application in Resonant-Tunneling-Diode Terahertz Oscillators”, Nat. Conv. Rec., IEICE, C-I-3-5, Niigata, Mar. 20, 2014. (Invited)
10. 浅田雅洋, 鈴木左文, 「共鳴トンネルダイオードによる室温テラヘルツ発振器」, 電子材料シンポジウム, 修善寺, 2014 年 7 月. (招待講演、発表予定).
    M. Asada and S. Suzuki, ” Room-Temperature Terahertz Oscillators Using Resonant Tunneling Diodes”, Electronic Material Symposium (EMS33), Shuzenji, July 2014. (Invited, to be presented)

Meeting Reports

1. 宮島悠, 忽滑谷拓郎, 鈴木左文, 浅田雅洋,「薄膜マイクロストリップパッチアンテナを集積した HEMT テラヘルツ受信素子の感度解析」, 電子情報通信学会テラヘルツシステム応用研究会, 講演 10, 札幌, 2013 年 8 月 6 日.
   Y. Miyajima, T. Nukariya, S. Suzuki, and M. Asada, “Sensitivity Estimation of HEMT Terahertz Detector integrated with Thin-film Microstrip Patch Antenna”, Meeting Report of Technical Group on Terahertz Application Systems, No.10, Sapporo, Aug. 6, 2013.
2. 鈴木左文, 浅田雅洋,「共鳴トンネルダイオードを用いたテラヘルツ発振器における最近の進捗と今後の展望」, 電子情報通信学会電子デバイス研究会, ED2013-95, 仙台, 2013 年 12 月 17 日.（招待講演）
   S. Suzuki and M. Asada, “Recent Progress and Future Prospects in Terahertz Oscillators using Resonant Tunneling Diodes”, Meeting Report of Technical Group on Electron Devices, IEICE, ED2013-95, Sendai, Dec. 17, 2013. (Invited)
3. 金谷英敏, 曽我部 陸, 前川 猛, 鈴木左文, 浅田雅洋,「コレクタスペーサ層厚最適化による共鳴トンネルダイオードテラヘルツ発振素子の 1.42 THz 基本波発振」, 電子情報通信学会電子デバイス研究会, ED2013-96, 仙台, 2013 年 12 月 17 日.
   H. Kanaya, R. Sogabe, T. Maekawa, S. Suzuki, and M. Asada, “Fundamental Oscillation up to 1.42 THz in Resonant Tunneling Diodes by Optimizing Collector Spacer Thickness”, Meeting Report of Technical Group on Electron Devices, IEICE, ED2013-95, Sendai, Dec. 17, 2013. (Invited)
4. 北川成一郎, 鈴木左文, 浅田雅洋,「周波数掃引機能を集積した共鳴トンネルダイオードテラヘツ発振器」, 電子情報通信学会電子デバイス研究会, ED2013-97, 仙台, 2013 年 12 月 17 日.
   S. Kitagawa, S. Suzuki, and M. Asada, “Wide-range Varactor-tuned Terahertz Oscillator Using Resonant Tunneling Diode”, Meeting Report of Technical Group on Electron Devices, IEICE, ED2013-97, Sendai, Dec. 17, 2013.

Books

1. Asada and S. Suzuki, “Resonant Tunneling Diodes for THz Sources”, Chapter 7, “Handbook of Terahertz Technologies: Devices and Applications”, Edited. by H.-J. Song and T. Nagatsuma, Pan Stanford Publishing, 2014 (出版予定).