

IMFEDK 2024 Advanced Program

Nov. 21 (Thu).....

Opening

9:30-9:40 Opening Remarks Mutsumi Kimura (Ryukoku University)

Poster Short Presentation

Chair: TBA

9:40-10:20

- P01 ***Electrical Characterization of Non-volatile Mott Transition in Mist CVD Deposited NiO Thin Films for CeRAM Applications***
Mamoru Ikeda, Masamichi Azuma, Tsubasa Miyamoto, and Hiroyuki Nishinaka
(Kyoto Institute of Technology)
- P02 ***Au doping effect on conductance change of polycrystalline MoS₂ device***
Shinji Okayasu, Kouichi Takase, Tomohiro Shimizu, Takeshi Ito, and Shoso Shingubara
(Kansai University)
- P03 ***Neuromorphic System Operation Using Multiple Devices with Integrated Memristor and Capacitor***
Takanori Ueo, Tokiyoshi Matsuda, Hidenori Kawanishi, and Mutsumi Kimura
(Ryukoku University)
- P04 ***A New Method to Extract Equivalent Circuit Parameters for Body Contact PD-SOI MOSFETs***
Wongi Cho and Seonghearn Lee
(Hankuk University of Foreign Studies)
- P05 ***Fabrication and evaluation of artificial neuron devices that uses vanadium dioxide***
Shaoping Jiang, Tomohiro Shimizu, Takeshi Ito, and Shoso Shingubara
(Kansai University)
- P06 ***A 2.5Gb/s CDR-PLL with Improved Phase Detector for Jitter Tolerance Enhancement***
Yasuhiro Okada and Tsutomu Yoshimura
(Osaka Institute of Technology)

- P07 ***Evaluation of lattice defects in Ga-Sn-O using electron spin resonance spectroscopy***
Kizashi Nemoto¹, Syusaku Takahashi¹, Hidenori Kawanishi¹,
Mutsumi Kimura¹, and Tokiyoshi Matsuda²
(¹Ryukoku University, ²Kindai University)
- P08 ***Dependence of the characteristics of Ga-Sn-O oxide semiconductor transistors on film thickness***
Ren Deguchi¹, Taiyo Shinoda¹, Yuki Kawasaki¹, Shunsuke Sano¹,
Hidenori Kawanishi¹, and Mutsumi Kimura¹, and Tokiyoshi Matsuda²
(¹Ryukoku University, ²Kindai University)
- P09 ***Diode Characteristics of Bilayer Ga-Sn-O Devices Fabricated by Mist CVD Method***
Ryohei Takahashi¹, Takeru Aoki¹, Hidenori Kawanishi¹, Mutsumi Kimura¹,
Tokiyoshi Matsuda², and Toshiyuki Kawaharamura³
(¹Ryukoku University, ²Kindai University, ³Kochi University of Technology)
- P10 ***Comparative Study of Gain Cells for Pseudo-SRAM***
Sei Yoshida, Yusaku Shiotsu, and Satoshi Sugahara
(Tokyo Institute of Technology)
- P11 ***Peeling and Measurement of Surface Oxide Film of Liquid Metal Alloys***
Kazuma Matsumura¹, Takahiko Ban¹, Masayoshi Ichimiya¹, Junichi Yanagisawa¹,
and Shin-ichi Yamamoto²
(¹The university of Shiga Prefecture, ²Ryukoku University)
- P12 ***Numerical Simulation of Photoconductivity in Monolayer Transition Metal Dichalcogenides for Optoelectronic Applications***
Akira Nakanishi and Satofumi Souma
(Kobe University)
- P13 ***Fabrication and Evaluation of Flexible Resistive Switching Devices Using Liquid Metal and Flexible Substrates***
Yusuke Hirano¹, Takahiko Ban¹, Masayoshi Ichimiya¹, Junichi Yanagisawa¹,
and Shin-ichi Yamamoto²
(¹The University of Shiga Prefecture, ²Ryukoku University)
- P14 ***Development of low-frequency RF magnetron sputtering system and investigation of the dependence of Ga-Sn-O thin films on deposition pressure***
Ryusei Hagihara and Tokiyoshi Matsuda
(Kindai University)
- P15 ***Achieving High Current Density in AlO_x/ZnO Multilayer TFTs for Flexible OLED Applications through Low-Temperature Post Annealing***
Kensuke Nakata, Kaiko Yuge, Akira Fujimoto, Hideo Wada, Masatoshi Koyama,
Akihiko Fujii, and Toshihiko Maemoto
(Osaka Institute of Technology)

P16 ***Optimization of ReRAM using Mist-CVD GTO films: Importance of substrate thickness, aging, and preparation procedure for improving switching ratio.***

Seiya Nakagawa¹, Kosuke Oyasu¹, and Tokiyoshi Matsuda²
(¹Ryukoku University, ²Kindai University)

Keynote Speech

Chair: Yoshinari Kamakura

10:20-11:00

KS01 (Keynote) ***Fast and sensitive terahertz detection at room temperature using MEMS resonators***

Kazuhiko Hirakawa¹ and Ya Zhang²

(¹University of Tokyo, ²Tokyo University of Agriculture and Technology)

11:00-11:20 Short Break

Session 1 - Silicon -

Chair: TBA

11:20-12:00

IN01 (Invited) ***Advanced CMOS technologies including 2D FETs (tentative)***

Hitoshi Wakabayashi

(Institute of Science Tokyo)

12:00-12:20

R01 ***MEMS resonator-based reservoir computing for epileptic seizure prediction***

Shuto Kawaguchi, Amit banerjee, Jun Hirotsu, and Toshiyuki Tsuchiya

(Kyoto University)

12:20-12:40

R02 ***Evaluation of the Impacts of V_{th} Variation and Leakage Current on the Signal-to-Noise Ratio of a Single-Shot HDR Image Sensor with a Lateral Overflow Transistor***

Takaaki E. Murakami, Yasuyuki Shimoi, Tsutomu Kobayashi, and Yoshihiro Sato

(Panasonic Holdings Corporation)

12:40-14:00 Lunch

Session 2 - Compound -

Chair: TBA

14:00-14:40

IN02 (Invited) ***Innovative Power Electronics for All Users – Progress in Ultra-Wide Bandgap α -Ga₂O₃***

Takashi Shinohe
(FLOSFIA Inc.)

14:40-15:00

R03 ***Improving the ZrO₂/re-grown AlGa_N interfaces by insulator Post Deposition Annealing for MIS-HEMTs Applications***

R. Kato¹, S. Terai¹, K. Sekiyama¹, T. Igarashi¹, K. Yamamoto¹, J. T. Asubar¹,
and M. Kuzuhara²

(¹University of Fukui, ²Kwansei Gakuin University)

15:00-15:20

R04 ***Deposition and optical properties of Mn²⁺-doped Cs₃Cu₂l₅ thin films***

Keisuke Watanabe and Hiroyuki Nishinaka
(Kyoto Institute of Technology)

15:20-15:40 Short Break

15:40-16:20 Presentation of Certificate of Gratitude

Memorial Recognition Award: Prof. Yasuhisa Omura

Years of Excellent Service to IEEE EDS Kansai Award: Dr. Tadashi Nishimura

Session 3 - Silicon -

Chair: TBA

16:20-17:00

IN03 (Invited) ***Silicon Integration Technology for Quantum Computing***
Takahiro Mori
(AIST)

17:00-17:20

R05 ***Evaluation of a BSIM4 Model at Cryogenic Temperature Using 65 nm Bulk Transistors***
Shin Taniguchi and Michihiro Shintani
(Kyoto Institute of Technology)

17:20-17:40

R06 ***A Novel Insight into Bulk Trap Generation at Cryogenic Temperatures***
Y. Miyaki, T. Suzuki, and Y. Mitani
(Tokyo City University)

17:40- Commemorative Photographing with All Participants

18:00- Banquet at *Café Ryukoku* & (1F in Jojukan)

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Session 4 - Compound -

Chair: TBA

9:30-10:10

IN04 ***Potential of GeO₂ as a power semiconductor***

Kentaro Kaneko
(Ritsumeikan University)

10:10-10:30

R07 ***Recessed-gate GaN-based MIS-HEMTs Performance Dependence on Recess Depth***

S. Yamao¹, K. Sekiyama¹, S. Terai¹, T. Igarashi¹, M. Ishiguro¹, A. Baratov¹,
J. T. Asubar¹, and M. Kuzuhara²
(¹University of Fukui, ²Kwansei Gakuin University)

10:30-10:50 Short Break

10:50-12:00 Poster Viewing Session

12:00-13:00 Lunch

Session 5 - Silicon -

Chair: TBA

13:00-13:40

IN05 (Invited) ***Characterization and Understanding of Cosmic Ray-Induced Soft Errors in SRAMs***

Masanori Hashimoto
(Kyoto University)

13:40-14:00

R08 ***Design of Highly-Stable Energy-Minimum-Point SRAM Using Ultralow-Voltage Retention Cell***

Katsutoshi Ito, Yusaku Shiotsu, and Satoshi Sugahara
(Tokyo Institute of Technology)

Session 6 - Emerging -

Chair: TBA

14:00-14:40

IN06 (Invited) **High-performance and Reliable Polycrystalline Indium Oxide Thin-Film Transistors**

Mamoru Furuta

(Kouchi Institute of Technology)

14:40-15:00

R09 **Thickness Dependence of Ferroelectricity for Thin (Al_{0.9}Sc_{0.1})N-based FeRAM**

Soshun Doko¹, Naoko Matsui¹, Toshikazu Irisawa¹, Koji Tsunekawa¹, Nana Sun², Yoshiko Nakamura², Kazuki Okamoto², and Hiroshi Funakubo²

(¹Canon ANELVA Corporation, ²Tokyo Institute of Technology)

15:00-15:20 Short Break

Session 7 - Emerging (online) -

Chair: TBA

15:20-16:00

IN07 (Invited) **Towards new memristive materials and devices**

Gisya Abdi, Lulu Alluhaibi, Ewelina Kowalewska, Tomasz Mazur, Andrzej Sławek, and Konrad Szaciłowski

(AGH University of Science and Technology)

16:00-16:20

R10 **Forming free resistive switching with battery-like characteristics in Ag/ZnFe₂O₄/ITO ReRAM device**

Adiba Adiba¹, Tufail Ahmad¹, and Ph. Nonglen Meitei²

(¹Aligarh Muslim University, ²IIT Guwahati)

Session 8 - Compound -

Chair: TBA

16:20-17:00

- IN08 (Invited) ***GaN high-frequency devices (tentative)***
Koji Yamanaka
(Mitsubishi Electric Corporation)

17:00-17:20

- R11 ***Impact of Rapid Thermal Annealing Temperature of Cu-based ohmic stack on Performance of GaN MIS-HEMTs***
R. T. Ahmed¹, S. Terai¹, K. Sekiyama¹, T. Igarashi¹, A. Baratov¹, J. T. Asubar¹,
and M. Kuzuhara²
(¹University of Fukui, ²Kwansei Gakuin University)

17:20-17:40

- R12 ***Uniformity in cell size of a locally anodized porous anodic alumina film***
Kosei Sato and Yasuo Kimura
(Tokyo University of Technology)

17:40-18:00 Short Break
(Award Assessments)

Awards & Closing

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| 18:00-18:20 | Award Presentation | Kazushi Hayashi (Kobe Steel, Ltd.) |
| 18:20-18:30 | Closing Remarks | Joel T. Asubar (University of Fukui) |