

**11<sup>th</sup> Superconducting SFQ VLSI Workshop (SSV 2018)**  
**6<sup>th</sup> CRAVITY Symposium**  
**Technical Program (as of 01/30/2018)**

Venue: National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

**Wednesday, February 7**

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|--------------------|---|-----------|
| <b>13:00–13:05</b> | <b>Opening Remarks</b>  | M. Hidaka |
| <b>13:05–13:10</b> | <b>Greeting</b>   | T. Yasuda |
| <br>               |   |           |
| <b>13:10–15:50</b> | <b>Oral Session I</b>   |           |
| 13:10–13:50        | [I-1] (Invited) T. H. Lee and D. J. Huang (National Synchrotron Radiation Research Center)<br>“Single Photon Detection for High-Resolution Soft X-Ray Spectroscopy”   |           |
| 13:50–14:10        | [O-1] C. Watanabe, N. Zen, G. Fujii, K. Makise, M. Ukibe, and M. Ohkubo (National Institute of Advanced Industrial Science and Technology)<br>“Development of Superconducting Nanostrip X-Ray Detector for High-Resolution Resonant Inelastic Soft X-Ray Scattering (RIXS)”   |           |
| 14:10–14:30        | [O-2] T. Taino <sup>1</sup> , S. Endo <sup>1</sup> , G. Fujii <sup>2</sup> , M. Ukibe <sup>2</sup> , H. Takagi <sup>2</sup> , M. Naruse <sup>1</sup> , H. Myoren <sup>1</sup> , C. Otani <sup>3</sup> , and M. Ohkubo <sup>2</sup> ( <sup>1</sup> Saitama University, <sup>2</sup> National Institute of Advanced Industrial Science and Technology, <sup>3</sup> RIKEN)<br>“STJ for Neutron Detector on Si-LBO Hybrid Substrate by Surface-Activated Room-Temperature Bonding” |           |
| 14:30–14:50        | [O-3] R. Kobayashi <sup>1,2</sup> , K. Hattori <sup>2</sup> , K. Niwa <sup>2</sup> , S. Inoue <sup>1</sup> , and D. Fukuda <sup>1,2</sup> ( <sup>1</sup> Nihon University, <sup>2</sup> National Institute of Advanced Industrial Science and Technology)<br>“Development of Titanium-Gold Bilayer Optical TES with Optical Fiber Self-Alignment Structure”   |           |
| <br>               |   |           |
| <b>14:50–15:10</b> | <b>Coffee Break</b>   |           |

15:10–15:30 [O-4] H. Matsuo<sup>1</sup>, H. Ezawa<sup>1</sup>, H. Kiuchi<sup>1</sup>, M. Honma<sup>1</sup>, Y. Murata<sup>2</sup>, M. Ukibe<sup>3</sup>, G. Fujii<sup>3</sup>, S. Shiki<sup>3</sup>, and M. Sakata<sup>4</sup> (<sup>1</sup>National Astronomical Observatory of Japan, <sup>2</sup>Japan Aerospace Exploration Agency, <sup>3</sup>National Institute of Advanced Industrial Science and Technology, <sup>4</sup>The University of Electro-Communications)

“Developments of Terahertz Intensity Interferometry using SIS Photon Counting Detectors”

15:30–15:50 [O-5] H. Yamamori<sup>1</sup>, T. Irimatsugawa<sup>1,2</sup>, Y. Nakashima<sup>1,3</sup>, F. Hirayama<sup>1</sup>, A. Sato<sup>1</sup>, S. Kohjiro<sup>1</sup>, S. Nagasawa<sup>1</sup>, M. Hidaka<sup>1</sup>, G. Fujii<sup>1</sup>, and M. Ohno<sup>2</sup> (<sup>1</sup>National Institute of Advanced Industrial Science and Technology, <sup>2</sup>University of Tokyo, <sup>3</sup>Japan Aerospace Exploration Agency)

“Resonator Q Factor and Fabrication Process of Microwave Multiplex Readout Circuits”

### **15:50–16:10      Short Poster Presentation**

### **16:10–17:10      Poster Session**

[P-1] A. Sanada, Y. Yamanashi, and N. Yoshikawa (Yokohama National University)

“Design of Single Flux Quantum Divider Based on Goldschmidt’s Division Algorithm”

[P-2] F. Ke<sup>1</sup>, Y. Yamanashi<sup>1</sup>, T. Ortlepp<sup>2</sup>, N. Yoshikawa<sup>1</sup> (<sup>1</sup>Yokohama National University, <sup>2</sup>CiS Research Institute for Microsensor Systems GmbH)

“Design and Simulation of a 7-bit 18-sample/cycle SFQ-Based Sine Wave Generator”

[P-3] H. Iwashita, S. Taniguchi, H. Kato, K. Sano, M. Tanaka, and A. Fujimaki (Nagoya University)

“AQFP Readout for Ferromagnetic Matrix Memory”

[P-4] H. Terai<sup>1</sup>, S. Miyajima<sup>1</sup>, M. Yabuno<sup>1</sup>, T. Yamashita<sup>1</sup>, S. Miki<sup>1</sup>, S. Nagasawa<sup>2</sup>, and M. Hidaka<sup>2</sup> (<sup>1</sup>National Institute of Information and Communications Technology, <sup>2</sup>National Institute of Advanced Industrial Science and Technology)

“16-Pixel Superconducting Nanowire Single-Photon Detectors Integrated with Single-Flux-Quantum Multiplexers”

[P-5] K. Akizuki, R. Sato, Y. Yamanashi, and N. Yoshikawa (Yokohama National University)

“Design of an SFQ Complex Event Detector Circuit Corresponding to Regular Expressions”

[P-6] K. Maruyama<sup>1</sup>, M. Suzuki<sup>1</sup>, N. Kondo<sup>1</sup>, K. Sano<sup>1</sup>, M. Tanaka<sup>1</sup>, M. Inoue<sup>2</sup>, and A. Fujimaki<sup>1</sup> (<sup>1</sup>Nagoya University, <sup>2</sup>Meijo University)

“Study on Operation Principle of Nanocryotrons”

[P-7] M. Araki, Y. Yamanashi, and N. Yoshikawa (Yokohama National University)

“Design and Evaluation of a 4-Input Logic Block for Realization of FPGAs Using Single Flux Quantum Circuits”

[P-8] T. Tamura<sup>1</sup>, C. Ayala<sup>1</sup>, N. Takeuchi<sup>1,2</sup>, Y. Yamanashi<sup>1</sup>, and N. Yoshikawa<sup>1</sup> (<sup>1</sup>Yokohama National University, <sup>2</sup>JST-PRESTO)

“Reduction of the Circuit Area of an 8-word by 1-bit Register Using Quantum Flux Parametron Latch”

[P-9] T. Yamae<sup>1</sup>, N. Takeuchi<sup>1,2</sup>, Y. Yamanashi<sup>1</sup>, and N. Yoshikawa<sup>1</sup> (<sup>1</sup>Yokohama National University, <sup>2</sup>JST-PRESTO)

“Design and Simulation of Reversible Adders Using Adiabatic Quantum Flux Parametron Logic”

[P-10] Y. Hironaka, C. Ayala, Y. Yamanashi, and N. Yoshikawa (Yokohama National University)

“Design of a 1-bit SFQ CPU and Comparison with CMOS and AQFP Circuits”

[P-11] Y. Matsui, K. Sano, M. Tanaka, and A. Fujimaki (Nagoya University)

“Study on Magnetically-Controlled Delay Time in Josephson Transmission Lines”

[P-12] Y. Tanaka<sup>1</sup>, H. Yamamori<sup>1</sup>, T. Yanagisawa<sup>1</sup>, T. Nishio<sup>2</sup>, and S. Arisawa<sup>3</sup> (<sup>1</sup>National Institute of Advanced Industrial Science, <sup>2</sup>Tokyo University of Science, <sup>3</sup>National Institute for Materials Science)

“Quantum Decomposer”

**17:30–19:30      Banquet**

## Thursday, February 8

### 9:00–10:30 Oral Session II: IAS-YNU Special Session

- 9:00–9:10 Opening Remarks for the IAS-YNU Special Session N. Yoshikawa
- 9:10–9:50 [I-2] (Invited) D. Gupta (HYPRES, Inc.)  
“Development of Design Infrastructure for Superconductor VLSI Circuits”
- 9:50–10:10 [O-6] N. Takeuchi<sup>1, 2</sup>, C. L. Ayala<sup>1</sup>, Q. Xu<sup>1</sup>, H. Suzuki<sup>1</sup>, Y. Yamanashi<sup>1</sup>, T. Ortlepp<sup>1, 3</sup>, and N. Yoshikawa<sup>1</sup> (<sup>1</sup>Yokohama National University, <sup>2</sup>JST-PRESTO, <sup>3</sup>CiS Research Institute for Microsensor Systems GmbH)  
“Recent Development and Applications of Adiabatic Quantum Flux Parametron Logic”
- 10:10–10:30 [O-7] C. L. Ayala<sup>1</sup>, N. Takeuchi<sup>1</sup>, Q. Xu<sup>1</sup>, Y. Yamanashi<sup>1</sup>, T. Ortlepp<sup>1,2</sup>, and N. Yoshikawa<sup>1</sup> (<sup>1</sup>Yokohama National University, <sup>2</sup>CiS Research Institute for Microsensor Systems GmbH)  
“Adiabatic Quantum-Flux-Parametron-Based Microprocessor: Architecture, Logic Design, Modeling, and Design Tools”

### 10:30–10:50 Coffee Break

### 10:50–14:40 Oral Session III

- 10:50–11:30 [I-3] (Invited) R. M. Heath<sup>1</sup>, K. Erotokritou<sup>1</sup>, J. Paul<sup>1</sup>, N. R. Gemmell<sup>1</sup>, A. Casaburi<sup>1</sup>, D. Sahin<sup>2</sup>, J. Barreto<sup>2</sup>, M. G. Thompson<sup>2</sup>, and R. H. Hadfield<sup>1</sup> (<sup>1</sup>University of Glasgow, <sup>2</sup>University of Bristol)  
“Superconducting Nanowire Single Photon Detectors: Waveguides, Arrays, and Scalability”
- 11:30–11:50 [O-8] Y. Mizugaki, Y. Arai, and T. Watanabe (The University of Electro-Communications)  
“Double-Flux-Quantum Amplifier Designed with Adjusted Damping Parameters for Proper Propagation of SFQ Pulses”
- 11:50–12:10 [O-9] H. Myoren (Saitama University)  
“Digital SQUID Magnetometer with Sub-Flux Quantum Feedback”

12:10–12:30 [O-10] S. Taniguchi, H. Kato, T. Kamiya, H. Iwashita, K. Sano, M. Tanaka, and A. Fujimaki (Nagoya University)  
“Power Conversion Efficiency of Superconductor Rectifier”

**12:30–13:40 Lunch**

13:40–14:00 [O-11] M. Hidaka and S. Nagasawa (National Institute of Advanced Industrial Science and Technology)  
“CRAVITY Activities Based on Digital Circuit Fabrication Process Technologies”

14:00–14:20 [O-12] S. Miyajima<sup>1</sup>, S. Miki<sup>1, 2</sup>, M. Yabuno<sup>1</sup>, T. Yamashita<sup>1, 3</sup>, and H. Terai<sup>1</sup>  
(<sup>1</sup>National Institute of Information and Communications Technology, <sup>2</sup>Kobe University, <sup>3</sup>JST-PRESTO)  
“Single Flux Quantum Based Timing Discriminator for Photon Detection with High-Time Resolution”

14:20–14:40 [O-13] T. Kamiya, S. Taniguchi, K. Sano, M. Tanaka, and A. Fujimaki (Nagoya University)  
“Low-Power Half Single Flux Quantum Circuits Using  $\pi$ -Shifted Josephson Junctions”

**14:40–14:50 Closing Remarks**

**15:00–16:00 CRAVITY Lab Tour**