30th International Symposium on Space Terahertz Technology (ISSTT 2019)

Gothenburg, Sweden
15-17 April 2019

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List of Registered Symposium Participants 240
Monday, April 15, 2019

08:45 – 09:00 Welcome

09:00 – 10:20 Session I. Instruments, Devices and Technologies for Small Satellites

Chair: Vincent Desmaris

09:00 – 09:20 Goutam Chattopadhyay - Planetary/Cometary Submillimeter-Wave Instruments on Ultra-Small Platforms. Page 19

09:20 – 09:40 Maria Alonso del Pino - Fly’s Eye Lens Phased Array for Submillimeter-Wave Space Instruments. Page 20

09:40 – 10:00 Jonathan Hoh - Development of an Integrated Dual-Band Schottky Receiver in the Terahertz Regime for Use in Cubesat Systems. Page 21

10:00 – 10:20 Christine P. Chen - Design and Fabrication of Silicon Stacked Architecture for 2.06 THz Receiver Front End. Page 22

10:50 - 11:30 Invited talk I

Donal Murtagh, Chalmers University of Technology - Mm and sub-mm spectroscopy in atmospheric science.

11:30 - 12:30 Session II. Schottky Receivers and Technologies

Chair: Jan Stake

11:30 – 11:50 Diego Moro-Melgar - Reliability and Reproducibility of Discrete Schottky Diodes-Based Sources up to 370 GHz. Page 26


12:10 – 12:30 Karl Jacob - Radiometric Performance of the 530 to 625 GHz Receiver Unit of the Submillimetre Wave Instrument on JUICEs. Page 28

13:50 - 14:30 Invited talk II

Karl-Friedrich Schuster, Institut de Radioastronomie Millimétrique - General Development Strategies for Millimeter-wave Astronomy and historic and current approaches at IRAM.
14:30 - 15:30 Session III. SIS Receivers and Mixers  
Chair: Christopher Groppi

14:30 – 14:50 Raymond Blundell - A 1.3 mm Superconductor Insulator Superconductor Mixer Receiver with 40 GHz Wide Instantaneous Bandwidth. Page 33

14:50 – 15:10 Takafumi Kojima - Performance of a 275-500 GHz SIS mixer with 3-22 GHz IF. Page 34

15:10 – 15:30 Wenlei Shan - Experimental Study of a Monolithic Planar-integrated Dual Polarization Balanced SIS Mixer. Page 35

16:00 - 17:00 Session IV. THz sources  
Chair: Imran Mehdi

16:00 – 16:20 Bertrand Thomas - Digitally tunable 150 GHz Local Oscillator chain for the Submillimeter Wave Instrument onboard the ESA JUICE mission. Page 37

16:20 – 16:40 Jose V. Siles - High-power broad-band room-temperature 2.46-2.70 THz LO sources to enable high-spectral resolution mapping of HD and [NII]. Page 38

16:40 – 17:00 Nickolay Kinev - Superconducting flux-flow oscillator as the terahertz external local oscillator for heterodyne receiving. Page 39

17:00 - 19:30 Poster Session

MM and Microwave Passive and Active Components

P1-1 Cristian López - Design and implementation of a broadband and compact 90-degree waveguide twist with simplified layout. Page 4

P1-2 Daniel Montofre - Study and Development of two Low-Cost and Easy-Construction Horn Antennas for Astronomy Applications. Page 44

P1-3 Jie Hu - Design of a Silicon-based 160 – 320GHz tanh-profile wideband Corrugated Horn. Page 46

P1-4 Cristian Lopez - Broadband Waveguide-to-Substrate Transition Using a Unilateral Etched Finline Structure. Page 47

P1-5 Hawal Rashid - Compact Wideband Passive and Active Component Chips for Radio Astronomy Instrumentation. Page 50

P1-6 Isaac Lopez-Fernandez - Compact Cryogenic Wide-Band Balanced Amplifiers with Superconducting 90° Hybrids for the IF of Submillimeter-Wave SIS Mixer. Page 57

P1-7 Patricio Mena - Modelling dielectric losses in microstrip traveling-wave kinetic-inductance parametric amplifiers. Page 63


P1-10 Penghui Zheng - A Robust 24-29 GHz Low Noise Amplifier with 1dB Noise Figure and 23 dBm P1dB. Page 72


SIS Mixers and Receivers

P2-1  Tobias Vos - Advanced tuning algorithms for increasing performance of high-frequency SIS mixers. Page 76

P2-2  Urs Graf - CHAI, the CCAT-prime Heterodyne Array Instrument. Page 77

P2-3  Kirill Rudakov - 240 GHz DSB receiver performance. Page 78

P2-4  Sina Widdig - Design and Fabrication of an on-Chip Sideband Separating (2SB) Balanced SIS Mixer for 400 – 500 GHz on a 9 µm Silicon Membrane. Page 80

P2-5  Andrey Khudchenko - First Results of the Sideband Separating Mixer for 850 GHz. Page 81

P2-6  Christophe Risacher - Instrumentation development for the 2020 decade at the NOEMA and 30m telescopes. Page 83

P2-7  Doug Henke - Configuring the ALMA Band 3 Cartridge into a Balanced 2SB Receiver. Page 84

SIS technology and other processing

P3-1  Matthias Kroug - Barrier Reduction and Sub-gap Leakage in Niobium Based SIS Junctions. Page 86

P3-2  Leonid Kuzmin - Array of Multichroic Double-Slot Antennas with Cold-Electron Bolometers for the 220/240 GHz channels of the LSPE Instrument. Page 87

P3-3  Alexey Pavolotsky - Specific capacitance of Nb/Al-AlN/Nb superconducting tunnel junctions. Page 92

P3-4  Alexander Lubchenko - Native oxide on ultra-thin NbN films. Page 95

P3-5  Kah Wuy Chin - Design of On-chip Broadband Band Selection Filter for Multi-chroic mm/submm Camera. Page 99

P3-6  Jing Li - NbN/AlN/NbN Superconducting Tunnel Junctions Fabricated for HSTDM. Page 100

HEB Mixers

P4-1  Narendra Acharya - MgB$_2$ HEB Terahertz Mixers: Diffusion- or phonon- cooled? Page 101

P4-2  Andrey Trifonov - An ultrathin normal metal bolometer as a promising terahertz mixer. Page 102
P4-3 Johanna Böhm - Development of a HEB mixer for the observation of molecular hydrogen on SOFIA. Page 104

P4-4 Sergey Cherednichenko - MgB$_2$ HEB Mixers with Nanopatterned Surfaces: Effect on the Noise Temperature and the LO Power. Page 105

P4-5 Wei Miao - Development of a Ti hot electron bolometer based on Johnson noise thermometry. Page 106

P4-6 Yoshihisa Irimajiri - Measurements of Receiver Noise Temperature of a Ni-NbN HEBM at 2-THz band. Page 107

**THz Optics and Devices**

P5-1 Yun'er Gan - Bandwidth of a 4.7 THz asymmetric Fourier grating. Page 109

P5-2 Eduard Driessen - A planar silicon metamaterial lens with integrated anti-reflection coating for frequencies around 150 GHz. Page 113

P5-3 Behnam Mirzaei - Asymmetric phase grating as 4.7 THz beam multiplexer for GUSTO. Page 114

P5-4 Shinsuke Uno - Development of mm/submm Frequency Selective Filters made with FPC Fabrication Technology. Page 117

P5-5 Tai Oshima - Development of mm/submm broadband anti-reflection coating exploiting the various expanded PTFEs measured with THz-TDS. Page 118

P5-6 Cassandra Whitton - Design of a Narrow-band 600GHz Metamaterial Flat Focusing Element. Page 119

P5-7 Sofia Rahiminejad - Low-loss Silicon MEMS Phase Shifter at 550 GHz. Page 122

P5-8 Haotian Zhu - Multilayer dielectric diagonal horn for reshaping THz QCL beam pattern. Page 123

P5-9 Cecile Jung-Kubiak - Broadband Antireflective Silicon Optics for Terahertz instruments. Page 124

P5-10 Irmantas Kasalynas - Optical performance of laser-patterned high-resistivity silicon wafer in the frequency range of 0.1 - 4.7 THz. Page 125

**THz Sources**

P6-1 Valery Koshelets - Spectral measurements of THz radiation from intrinsic BSCCO stacks; Phase locking of the DSCCO oscillators. Page 128

P6-2 Peter Sobis - 4.7 THz GaAs Schottky Diode Receiver Components. Page 133

P6-3 Josip Vukusic - Reliability assessment of GaAs and InP THz mixers and frequency multipliers fabricated on 3" wafers. Page 134

P6-4 Leonid Revin - YBaCuO Josephson generators as THz sources for
P6-5  Sajjad Mahdizadeh - A 4.7 THz QCL phase locking experiment. Page 136

P6-6  Fei Yang - A 900GHz Broadband Balanced Frequency Quadrupler. Page 137

P6-7  Peng Chen - A 410-510GHz Local Oscillation Source for SIS Mixers. Page 138

Systems


P7-2  Grigoriy Bubnov - Astroclimate investigations review for coming radio astronomy projects. Page 143

P7-3  Sylvain Mahieu - Atmospheric Phase Monitoring Interferometer for the NOEMA Observatory. Page 149


Antennas and Telescopes

P8-1  Hayato Takakura - Far-sidelobe Measurements of LiteBIRD Low Frequency Telescope Scaled Model. Page 155


P8-3  Yuan Qian - Characteristics Investigation on Thermal Deformation of Large Size Terahertz Reflector Antenna in Space. Page 158

Tuesday, April 16, 2019

08:45 - 10:05 Session V. SIS Devices and Receivers

Chair: Christophe Risacher

08:45 – 09:05  Edward Tong - Noise Analysis of SIS Receivers Using Chain Noise Correlation Matrices. Page 163

09:05 – 09:25  Denis Meledin - A 1mm SIS Receiver Utilizing Different IF Configurations. Page 164


13:50 - 14:30 Invited talk III


11:30 - 12:30 Session VI. Future Missions and Projects - I

Chair: Patricio Mena

11:15 – 11:35 Paul Goldsmith - A Space Mission to Probe the Trail of Water. Page 172

13:30 - 14:10 Invited talk IV

Paola Caselli, Max-Planck-Institute for Extraterrestrial Physics - Astrochemistry at the dawn of star and planet formation.

14:10 - 15:10 Session VII. THz Optics and Antennas

Chair: Hiroshi Matsuo

14:30 – 14:50 Andrey Baryshev - In Flight Measurements System of Millimetron Primary Mirror Surface. Page 184
14:50 – 15:10 Jose Silva - Far-field beam pattern technique for high pointing accuracy characterization of GUSTO HEB mixer arrays. Page 185

15:40 - 17:20 Session VIII. HEBs and KIDs

Chair: Gregory Goltsman

15:40 – 16:00 Yuan Ren - Mid-infrared heterodyne receiver based on a superconducting hot electron bolometer and a quantum cascade laser. Page 187
16:00 – 16:20 Akira Kawakami - 2 THz Hot Electron Bolometer Mixer using a Magnetic Thin Film. Page 188
16:20 – 16:40 Changyun Yoo - Demonstration of a TACIT Heterodyne Detector at 2.5 THz. Page 191
16:40 – 17:00 Tess Skyrme - Understanding dissipative behaviour in superconducting microresonators over a wide range of readout power. Page 192
17:00 – 17:20 Eduard Driessen - Increased multiplexing of kinetic-inductance detector arrays by post-characterization adaptation of the individual detectors. Page 193

17:40 - 18:20 Session IX. Future Missions and Projects - II

Chair: Valery Koshelets

17:40 – 18:00 Hiroshi Matsuo - Prospects of High Angular Resolution Terahertz Astronomy from Antarctica. Page 195
18:00 – 18:20 Viacheslav Vdovin - New stage of the Suffa Submm Observatory in Uzbekistan Project. Page 196

Wednesday, April 17, 2019

08:45 - 10:05 Session X. Future Missions and Projects - III

Chair: Edward Tong

08:45 – 09:05 Jose V. Siles - COMETS – Comets Observation & Mapping Enhanced THz Spectrometer at 210-580 GHz: Objectives and Development Status. Page 203
09:05 – 09:25 Martina Wiedner - The Origins Space Telescope and the Heterodyne Receiver HERO. Page 204
09:25 – 09:45 Christopher Groppi - The Terahertz Intensity Mapper (TIM): a Next-Generation Experiment for Galaxy Evolution Studies. Page 208
09:45 – 10:05 Satoshi Ochiai - Study for proposal of SMILES-2 to JAXA M-class mission. Page 216

10:35 - 11:15 Invited talk V

Susanne Aalto, Chalmers University of Technology - Molecules as probes of galaxy evolution - exploring the hidden growth of galaxies.

11:15 - 12:35 Session XI. QCL THz Sources

Chair: Heinz-Wilhelm Hübners

11:15 – 11:35 Marc Mertens - A Double-Metal QCL with Backshort Tuner. Page 221
11:35 – 11:55 Martin Wienold - Frequency tuning of terahertz quantum-cascade lasers by optical excitation. Page 222
11:55 – 12:15 Till Hagelschuer - A compact 4.7-THz source based on a high-power quantum-cascade laser with a back-facet mirror. Page 223
12:15 – 12:35 Yuner Gan - 81-beam supra-THz local oscillator by a phase grating and a quantum cascade. Page 224
13:45 - 15:25 Session XII. Radars, Systems, Backend  
Chair: Sheng-Cai Shi


14:25 – 14:45 Theodore Reck - Cold-Source Noise Temperature Measurements with a Vector Network Analyzer Frequency Extender at WR-6.5. Page 228


16:05 - 17:25 Session IV. New Devices and Technologies  
Chair: Jian-Rong Gao

16:05 – 16:25 Sergey Cherednichenko - Quantum transport at Dirac point enables graphene for terahertz heterodyne astronomy. Page 236

