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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](#)
- 11:50–12:10 Jeanne Treuttel - Development of Room-Temperature Schottky Diode Technology for applications in the Tera-Hertz ranges. Page [27](#)
- 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 chian 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 wide-band 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](#)
- P1-8 Vincent Desmaris - Characterization of GaN-based Low Noise Amplifiers at Cryogenic Temperatures. Page [67](#)

- P1-9 Marko Neric - Design and Prototyping of Novel Cryogenic Flexible Stripline Transmission Lines as an Alternative to Semi-Rigid Coaxial Cables. Page [69](#)
- P1-10 Penghui Zheng - A Robust 24-29 GHz Low Noise Amplifier with 1dB Noise Figure and 23 dBm P1dB. Page [72](#)
- P1-11 Masui Sho - Design of a Radio Frequency Waveguide Diplexer for Dual-band Simultaneous Observation at 210-375 GHz. Page [73](#)

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 μ m 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 Lubenchenko - 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 - MgB₂ 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 - MgB₂ 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 Yuner 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

- bolometer characterization. Page [135](#)
- 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

- P7-1 Axel Murk - Characterization of Digital Real-Time Spectrometers for Radio Astronomy and Atmospheric Remote Sensing. Page [139](#)
- 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](#)
- P7-4 Igor Lapkin - New Optics for SEPIA – Heterodyne Facility Instrument for APEX Telescope. Page [150](#)

Antennas and Telescopes

- P8-1 Hayato Takakura - Far-sidelobe Measurements of LiteBIRD Low Frequency Telescope Scaled Model. Page [155](#)
- P8-2 Xiaodong Ren - Holographic Measurement System for the CCAT-prime Telescope – System Design and Novel Software Approach. Page [157](#)
- 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](#)
- 09:25–09:45 Boon Kok Tan - Noise Characterisation of a Flux-Pumped Lumped-Element Josephson Parametric Amplifier using an SIS Mixer. Page [168](#)
- 09:45–10:05 John Garrett - Multi-tone Spectral Domain Analysis of a 230 GHz SIS Device. Page [169](#)

13:50 - 14:30 Invited talk III

Leonardo Testi, *European Organisation for Astronomical Research in the Southern Hemisphere* - The ALMA 2030 Development Roadmap: science goals and instrument development vision.

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](#)
- 11:35–11:55 Christopher Groppi - First Generation Heterodyne Instrumentation Concepts for the Atacama Large Aperture Submm/mm Telescope. Page [173](#)
- 11:55–12:15 Andrei Smirnov - Millimetron Space Observatory: progress in the development of payload module. Page [180](#)

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*

- 14:10–14:30 Richard Hills - Wide-Field Designs for Off-Axis Telescopes: Application to the Optics of CCAT-prime. Page [183](#)
- 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 Hübers

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

- 13:45 – 14:05 Bernd Klein - Digital high-resolution wide-band Fast Fourier Transform Spectrometer. Page [226](#)
- 14:05 – 14:25 Ken Cooper - Validation Measurements of Humidity Profiling in Rain Using a 170 GHz Differential Absorption Radar. Page [227](#)
- 14:25 – 14:45 Theodore Reck - Cold-Source Noise Temperature Measurements with a Vector Network Analyzer Frequency Extender at WR-6.5. Page [228](#)
- 14:45 – 15:05 Gabriel Santamaria Botello - On the Comparison Between Low Noise Amplifiers and Photonic Upconverters for Millimeter and Terahertz Radiometry. Page [229](#)
- 15:05 – 15:25 David Monasterio - A broadband down-conversion module for the extended W-Band. Page [233](#)

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](#)
- 16:25 – 16:45 Hajime Ezawa - Design and Evaluation of SIS Photon Detectors at Terahertz Frequencies. Page [237](#)
- 16:45 – 17:05 Wen Zhang - Near infrared photon detectors using titanium-based superconducting transition-edge sensors. Page [238](#)
- 17:05 – 17:25 Andrey Pankratov - On-chip refrigerator integrated into a photon-noise-limited detector for high-performance Cosmology missions. Page [239](#)