

Tagung

Kryoelektronische Bauelemente



Workshop Programme

Sunday, 29 September 2019

13:00 – 19:00 **Arrival and Registration**

Tutorial: Electrical Quantum Metrology and the revised SI

15:00 – 15:15 **Workshop Opening**

15:15 – 16:00 **Single electron pumps and the revised SI system of units**

Hans Werner Schumacher, PTB Braunschweig

16:00 – 16:30 **Coffee Break**

16:30 – 17:15 **LTS fabrication technology for superconductive electronics**

Johannes Kohlmann, PTB Braunschweig

17:15 – 18:00 **Josephson-based quantum measuring systems**

Ralf Behr, PTB Braunschweig

19:00 – 20:00 **Dinner**

20:00 – ... **Get together**

Monday, 30 September 2019

Session 1: Detectors and Sensors

- 08:45 – 08:50 **Opening and Welcome**
Johannes Kohlmann, PTB Braunschweig
- 08:50 – 09:15 **THz Microscopy of additive manufactured metamaterials with Josephson cantilevers**
Benedikt Hampel, TU Braunschweig
- 09:15 – 09:40 **Development of a beta spectrometry setup using Metallic Magnetic Calorimeters**
Michael Paulsen, PTB Berlin & Heidelberg University
- 09:40 – 10:05 **Towards energy dispersive X-ray spectroscopy with sub-eV energy resolution: Metallic magnetic calorimeters with direct sensor readout**
Matthäus Krantz, Heidelberg University
- 10:05 – 10:30 **SQUID-based multiplexers for the readout of metallic magnetic calorimeter based detector arrays**
Sebastian Kempf, Heidelberg University
- 10:30 – 11:00 **Coffee Break**

Session 2: SQUIDS

- 11:00 – 11:25 **Highly scalable readout electronics for large multi-channel dc-SQUID systems**
Sylke Bechstein, PTB Berlin
- 11:25 – 11:50 **Fully integrated high T_c DC SQUID magnetometers for advanced geophysical application**
Leonie Kaczmarek, IPHT Jena
- 11:50 – 12:15 **A novel SQUID based semi-airborne instrument for electromagnetic mineral exploration**
Ronny Stolz, IPHT Jena
- 12:15 – 12:40 **Dc-SQUIDS based on cross-type Nb/Al-AlO_x/Nb Josephson tunnel junctions**
Fabienne Bauer, Heidelberg University
- 12:45 – 14:15 **Lunch Break**

Session 3: Metrology

14:15 – 14:40 **Development of RF-power dividers for the Josephson Arbitrary Waveform Synthesizer (JAWS)**
Hao Tian, PTB Braunschweig

Session 4: Novel Developments

14:40 – 15:05 **Supercool neurons: building a neuron in superconducting Niobium**
Frank Feldhoff, TU Ilmenau

Session 5: Cooling Systems

15:05 – 15:30 **Pulse tube cryocoolers designed for sensitive measurements**
Bernd Schmidt, cryo.TransMIT & Gießen University

15:30 – 16:00 **Coffee Break**

Poster Session (16:00 – 18:30)

19:00 – 20:00 **Dinner**
20:15 – 21:15 **Meeting of the Scientific Committee**
20:00 – ... **Get together**

Tuesday, 1 October 2019

Session 6: Superconducting Quantum Circuits

- 09:00 – 09:25 **Investigating defects in superconducting qubits with electric fields**
Jürgen Lisenfeld, KIT Karlsruhe
- 09:25 – 09:50 **Can we further reduce dissipation and dephasing in superconducting quantum oscillators?**
Ioan M. Pop, KIT Karlsruhe
- 09:50 – 10:15 **Phonon traps to reduce the density of non-equilibrium quasiparticles in superconducting circuits**
Francesco Valenti, KIT Karlsruhe
- 10:15 – 10:20 **Some details for the lab tour at PTB**
- 10:20 – 10:50 **Coffee Break**
- 10:50 – 11:15 **Optimal control of a compact 3D quantum memory**
Frank Deppe, WMI Garching / TU & MCQST München
- 11:15 – 11:40 **Challenges in the development of a three-wave mixing traveling-wave Josephson parametric amplifier**
Christoph Kissling, PTB Braunschweig

Session 7: HTS Josephson Junctions

- 11:40 – 12:05 **Josephson junctions and ultradense pinning arrays in YBCO thin films created by focused He ion beam irradiation**
Max Karrer, Tübingen University
- 12:05 – 12:20 **Closing Remarks**
- 12:30 – 13:15 **Lunch Break**
- 13:15 **Departure to PTB (hotel lobby)**
- 14:00 – 16:15 **Lab Tour at PTB**



- 1 **Small scale 4 K Pulse Tube Cryocooler driven by smart Helium compressor: Analysis of pressure-induced variations**
Jack-Andre Schmidt, Gießen University & TransMIT GmbH, Gießen
- 2 **A sustainable sub-Kelvin cooling technology for quantum electronics**
Alexander Regnat, TU München & kiutra, München
- 3 **Optimisation of a Josephson travelling-wave parametric amplifier with three-wave mixing by circuit simulations**
Victor Gaydamachenko, PTB Braunschweig
- 4 **Coupling of fundamental modes in Nb microwave resonator with controlled Josephson nonlinearity**
Marat Khabipov, PTB Braunschweig
- 5 **Microwave loss in rf-SQUIDs embedded in a coplanar waveguide**
Christoph Kissling, PTB Braunschweig
- 6 **Design of a read-out system for Cosmic Microwave Background Radiation**
Juan Manuel Salum, ITeDA and UNSAM, Argentina & KIT Karlsruhe
- 7 **Local superconducting fluctuations in nanowire single-photon detectors and count statistics**
Alexej Semenov, DLR Berlin
- 8 **Photon-number-resolving Transition-Edge Sensors for the characterization of photonic microstructures based on semiconductor quantum dots**
Jörn Beyer, PTB Berlin
- 9 **Investigation of mixing of microwave and terahertz radiation with superconducting Josephson cantilevers in a THz microscope**
Marco Tollkühn, TU Braunschweig

- 10 **Detecting the motion of mechanical oscillators with superconducting quantum interference devices**
Kevin Uhl, Tübingen University
- 11 **Advanced vector nanoSQUIDs based on trilayer Nb-HfTi-Nb Josephson junctions**
Robin Hutt, Tübingen University
- 12 **Size and temperature dependence of electrical transport properties of sub-micron Nb-HfTi-Nb SNS-type Josephson junctions**
Julian Linek, Tübingen University
- 13 **Highly sensitive SQUID gradiometer based on submicron cross-type Josephson junctions fabricated in Mix&Match technology**
Jürgen Kunert, IPHT Jena
- 14 **Magnetically robust Coreless Cryogenic Current Comparator for non-destructive Charged Particle Beam Monitoring**
Matthias Schmelz, IPHT Jena
- 15 **Rapid CCC prototyping**
Max Stapelfeld, Jena University
- 16 **Three-dimensional structuring of high-temperature superconductors with EBL**
Dominik Hanisch, TU Braunschweig
- 17 **Design of experiments for optimization and uncertainty determination of epitaxial YBa₂Cu₃O₇ thin films on MgO (100)**
Denis Kajevic, TU Braunschweig
- 18 **Uni/bipolar optical pulse-drive for the Josephson Arbitrary Waveform Synthesizer**
Oliver Kieler, PTB Braunschweig

Poster Session (Monday, 30 Sept. 2019, 16:00 – 18:30): Pt. 3 of 3

- 19 **Calibration of an Inductive Voltage Divider using pulse-driven Josephson voltage standards**
Jonas Herick, PTB Braunschweig
- 20 **Four terminal pair impedance bridge based on two pulse-driven Josephson arrays and a Graphene Quantum Hall System**
Yaowaret Pimsut, PTB Braunschweig & NIM Thailand
- 21 **Analysis of systematic errors in a Josephson Arbitrary Waveform Synthesizer**
Marco Kraus, PTB Braunschweig

