TG Quantum Electrical Standards Overview

TG Leader	Hans Werner Schumacher

TG Activities

- Develop novel and improved quantum electrical standards for electrical current, electrical resistance, and voltage: improved single electron pumps, novel quantum Hall materials and advanced Josephson circuits
- Support collaboration on new materials for standards (e.g. Graphene), measurement techniques and capabilities (i.e. nanomagnetism measurements to study topology or quantum calibrated AFM);
- Utilize the improved uncertainties to validate the foundations of electrical quantum metrology;
- Realize the most precise measurement to date of the quantum metrology triangle;
- Contribute to the CRC Quantum Precision

TG Competences/Services

- …..

Involved QF Members

Members	Institution	Relevant Expertise
Hans Werner Schumacher, Leader	PTB	Macroscopic Quantum Standards; Precision current metrology of single electron pumps; NV-centre-based magnetometry
Thomas Gerster	PTB	Macroscopic Quantum Standards
David Reifert	PTB	Macroscopic Quantum Standards
Patrik Recher	TUBS	Theory of Emergent Correlated Quantum Matter; Josephson Junctions; Twisted Bilayer Graphene; Twisted-bilayer-graphene physics in ultracold atoms in optical potentials
Peter Silvestrov	TUBS	Twisted Bilayer Graphene
Rolf Haug	LUH	Two-dimensional materials, Electrical Quantum Effects, Magnetic Quantum Effects
Michael Oestreich	LUH	Spin and charge dynamics of single carriers in single semiconductor quantum dots
Lina Bockhorn	LUH	Electrical Quantum Effects
N.N.	LUH	Two-Dimensional Materials
Meinhard Schilling	TUBS	Electronic Quantum Metrology; Optical Voltage Standard - Fast Prototyping and HTS Superconductors
Marco Tollkühn	TUBS	Optical Voltage Standard - HTS Superconductors
Ilya Elenskiy	TUBS	Optical Voltage Standard – Fast Prototyping

Hansjörg Scherer	PTB	Anomolous Quantum Hall Effect with Topological Materials
Frank Hohls	PTB	Low-Dimensional Electron Systems
Claus Lämmerzahl	ZARM	Quantum Sensors in Free Fall; Relativistic Geodesy; Quantum Objects in Gravity