Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

QE

Quantum Efficiency Seminar und Colloquium

MARIA KAMINSKA

Institute of Experimental Physics
University of Warsaw

Microwave spectroscopy in use for studies of novel materials: topological insulators, graphene and molecular PV structures

EPR (Electron Paramagnetic Resonance) spectrometers are generally dedicated to studies of paramagnetic defects, especially in crystalline materials, for which they provide reach information about paramagnetic centers and their surroundings. When a Q (quality)-factor of a microwave cavity changes because of a resonance microwave absorption driven by magnetic field, such classical EPR signals can be observed. However, the Q-factor changes can be also due to absorption (resonance or non-resonance) via electric field. This way cyclotron resonance transitions as well as magneto-transport properties like weak localization (weak antilocalization) or Shubnikov – de Haas oscillations can be detected. Thus a standard EPR spectrometer provides a convenient contactless method for electron transport research.

In the seminary I will present microwave spectroscopy in application to study of topological insulators, graphene, and materials for molecular photovoltaics. Both classical EPR signals as well as electric-field driven signals will be discussed.

Among others,

- cyclotron resonance due to relativistic fermions at the surface of Bi2Te3 3D topological insulator,
- weak localization due to decoherence processes in graphene layers grown at different conditions,
- charge transfer processes in polymer-fullerene materials

will be shown.

Date: **Tuesday, June 4th, 2013, 16:15**
Location: **Lecture Hall 1, Hermann-Herder-Str. 3, Freiburg**

Contact: Andreas Buchleitner, Institute of Physics, Quantum Optics and Statistics
T +49 761 203 5821 F +49 761 203 5967 E buchleitner_office@physik.uni-freiburg.de
www.physik.uni-freiburg.de