CONTACTS

Tomáš Šikola
CEITEC and Institute of Physical Engineering,
Brno University of Technology
sikola@fme.vutbr.cz

Joris van Slageren
Institute of Physical Chemistry, University of Stuttgart
slageren@ipc.unistuttgart.de

Rainer Hillenbrand
CIC nanoGUNE
r.hillenbrand@nanogune.eu

Richard Wylde
Thomas Keating Ltd.
R.Wylde@terahertz.co.uk

CEITEC VUT
Purkyňova 123, 612 00 Brno
www.peter-instruments.eu

PETER

TK INSTRUMENTS

BRNO UNIVERSITY OF TECHNOLOGY

CEITEC

Universität Stuttgart

CIC nanoGUNE
nanoscience cooperative research center

This project has received funding from the European Union's Research and Innovation programme Horizon 2020 under Grant Agreement No. 767227.

PETER

PLASMON ENHANCED TERAHERTZ ELECTRON PARAMAGNETIC RESONANCE

Horizon 2020
project FET OPEN

www.peter-instruments.eu

NEW ERA OF EPR MICROSCOPY

DEMAND

In our ever-evolving world we are facing many complex scientific issues. To solve them, there is a constant demand for new scientific discoveries. Diving deeper and trying to examine the structure and function of materials and substances is one of the ways to achieve it.

PRINCIPLE

Thanks to the new method based on the Plasmon principle we are at the dawn of a new era of EPR microscopy. With enhancing the local magnetic field component by plasmons we can get high fidelity information about the material and its properties from just a very small area.

SCIENTIFIC BREAKTHROUGH

Based on these principles, PETER scientists from CEITEC BUT, University of Stuttgart, CIC NanoGUNE and Thomas Keating Ltd. (UK) developed a new type of AFM microscope. Plasmon antennas attached to the tip of the probe enable us microscopic investigation of analytes with a spatial resolution deep below the diffraction limit of 1μm.

RESULTS

This technology will find its place in various scientific fields. Thanks to its high resolution and higher sensitivity we will be able to clearly distinguish different types of tumour cells, increase the battery lifetime, develop new organic and inorganic photovoltaic cells, or broaden our knowledge of quantum technologies leading us to a better and sustainable future.

PETER CONCEPT

PETER introduces a qualitatively new approach into the EPR area. It builds upon the strong enhancement and subwavelength spatial resolution of magnetic sensing field provided by plasmonic effects based on collective oscillations of electrons at surfaces or in nanostructures.

In contrast to usual THz plasmon-enhanced spectroscopy of nonmagnetic materials, we build upon magnetic plasmonic resonances. This presents unprecedented implementation of plasmonic phenomena into EPR technique. Our technology introduces for the first time plasmonic effects into THz EPR.