Leibniz Ferdinand Braun Institut

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Portable, spectrometer-free Raman measurement system

Raman spectroscopy is a proven method for the non-destructive identification of samples. Within recent years, innovative diode lasers and diode laser systems have been developed at the FBH to apply SERDS (shifted excitation Raman difference spectroscopy). This method allows to efficiently separate the weak Raman signatures from obscuring backgrounds. FBH lasers were implemented into Raman measurement systems containing sophisticated CCD-based spectrometer systems, which have been successfully applied for the detection of various substance in fruits, agricultural soils, and human skin.

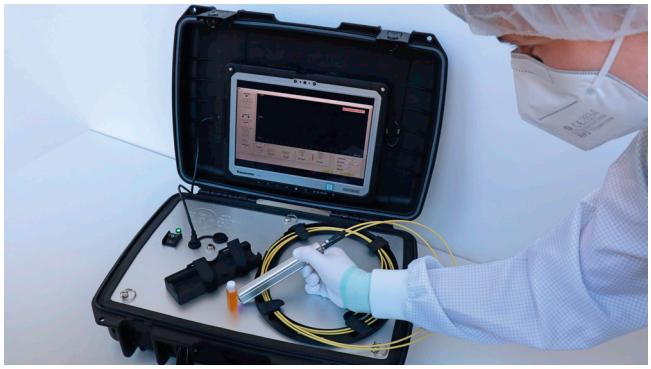
Addressing one specific substance with a pronounced isolated Raman signature, the measurement system can dispense of a spectrometer using a special filter system. This patented concept makes Raman measurement systems more compact and cost-effective.

Specifications

- alternating dual wavelength operation up to 1 kHz
- excitation wavelengths between 450 nm and 830 nm (in the presented case 456 nm)
- optical power up to 200 mW

Handheld probe for mobile Raman measurements.

This system was developed within the framework of the iCampus Cottbus.



Spectrometer-free system for Raman measurements of ß-carotene using an integrated filter.

Applications

- Raman measurements of specific substances (in the presented case ß-carotene)
- in situ measurements in agriculture, point-of-care diagnostics, and food control

Profile

The Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) researches electronic and optical components, modules and systems based on compound semiconductors. In the field of III-V electronics, it manufactures high-frequency devices and circuits for communications, power electronics, and sensor technology. Moreover, FBH develops light sources from the visible to the UV spectral range: high-power diode lasers, UV light sources, and hybrid laser systems. Applications range from medical technology, materials processing and sensors to optical communications in space and integrated quantum technology. In close cooperation with industry, its research results lead to cutting-edge products.

The institute has a staff of 350 employees, is a member of the Leibniz Association and part of Research Fab Microelectronics Germany (FMD).