

Ultrasensitive bolometers for security applications

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RADESS The project consortium develops sensing technologies for electromagnetic radiation in the frequency band of 0.3–1 THz. The band is particularly useful in security applications, thanks to the radiation penetration through materials used in clothes. This is utilized in the detection of concealed objects. In addition, compared to, e.g., radio waves or microwaves, comparably short wavelength enables realization of high-resolution imaging systems. The background of the research groups in the consortium extends from the research of the physical phenomena present in superconductors and carbon nanomaterials relevant in detector operation, into the system-level development of security imaging systems. This project develops different detection approaches aiming to scalable ultrasensitive detector technologies. Concrete objectives include the detection of room temperature objects with maximal contrast, i.e., as limited by the natural background noise. We also aim to demonstrate the detection of single quanta of light at THz frequencies. This would be a significant milestone in the development of extremely sensitive radiation detectors.