Diploma thesis abstract

« Nonlinear optical diagnostics in the visible and terahertz frequency ranges of subwavelength quantum dots on a silicon surface under ultrahigh vacuum conditions»

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In the master's degree work it was shown:

The presence of a metal film on the silicon surface makes a significant contribution to the intensity and spectrum of terahertz radiation generated from the film-substrate interface. The high sensitivity of the method of generating terahertz radiation under the action of a femtosecond laser pulse on the surface to the thickness and topology of the film is shown.

Analogously to experiments on transmission of THz radiation through a film deposited on a substrate, a high sensitivity to the thickness of the particle sizes of order 5÷8 nm is observed.

Experiments on the generation of the second harmonic in ultrahigh vacuum conditions confirmed the sensitivity of the nonlinear-optical response to the properties of the film deposited on the semiconductor surface and to the sign of conductivity of the substrate.

The spectrum of terahertz radiation generated from the film-semiconductor interface is highly sensitive to the thickness of the film and the sign of conductivity of the substrate.