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Title

Terahertz Detection of Quantum Cascade Laser Emission by Plasma Waves in Field Effect Transistors

Source

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Abstract

We report on the resonant detection of a 3.1 THz radiation produced by a quantum cascade laser using a 250 nm gate length GaAs/AlGaAs field effect transistor at liquid nitrogen temperature. We show that the physical mechanism of the detection is related to the plasma waves excited in the transistor channel. The detection is enhanced by increasing the drain current and driving the transistor into saturation regime. These results clearly show that plasma wave nanometer-size transistors can be used as detectors in all-solid-state terahertz systems where quantum cascade lasers act as sources.