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Compact quasi-optical Schottky detector with fast voltage response

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Abstract

Zero-bias Schottky diode detectors operated at room-temperature are the choice for applications, where the ultimate sensitivity of a cryogenic detector is not needed. Furthermore Schottky detectors are intrinsically much faster than the latter ones. This paper describes a compact quasi-optically coupled zero-bias planar Schottky-diode detector with monolithically integrated logspiral antenna for monitoring picosecond pulses of intense, coherent far-infrared radiation from the free-electron laser (FEL) FELBE at HZDR, Germany. The detector offers an intrinsic response time of less than 16.8 ps for short collimated THz pulses at 1.315 THz.