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Abstract:In the present work, azimuthal angle dependences of the terahertz (THz) pulse emission from lower symmetry, (311) planes of porous GaAs samples have been studied. GaAs porous layers were prepared by pulsed anodic electrochemical etching of n-type (311) GaAs wafers in mixed acidic fluoride-iodide electrolyte. It has been discovered that the anodic electrochemical etching of the GaAs sample significantly enhances its terahertz radiation emissivity. It was shown theoretically that for this crystallographic plane the contributions of both optical rectification (OR) and electricfield- induced optical rectification (EFIOR) effects are characterized by different azimuthal angle dependences. Experimental measurements were compared with the theoretical calculations of the azimuthal angle dependencies; it has been shown that both nonlinear optical effects are necessary to take into account when explaining the experimental observations. © Springer Science+Business Media, LLC 2012.
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