

Coordinate sensitive photodetectors based on InGaAs/InP heterostructures

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Abstract

The dependence of the longitudinal photo-e.m.f. in In_{0.53}Ga_{0.47}As p-n junctions on the coordinate x of the light spot and temperature has been investigated. A linear dependence $V_{phl} = f(x)$ has been observed and the V_{phl} temperature dependence in the 100-300 K range is determined by the carrier mobility change. A quadrant p-i-n photodiode based on an InP/InGaAs/InP heterostructure was fabricated and its electrical characteristics studied. The photodetector shows wide spectral characteristics (0.9-1.7 μm) with a responsivity of each element of 0.62 A/W and a slope of the inversion characteristics of $K = (0.8-1.0) \cdot 10^3 \text{ V/W}\cdot\text{mm}$.