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Light Emission From Travelling Space Charge Domains

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**Abstract:** We report light emission from n-doped GaAs epilayers associated with impact ionization when the device is biased in the negative difference resistance (NDR) regime ( $F > 3.5 \text{ kV cm}^{-1}$ ). Spectral distribution of the emitted light (electroluminescence) has been measured to identify the energy distribution of the recombining electron-hole pairs. Electron temperatures, calculated from the high energy tail of the electroluminescence spectra, show that the light emission is due to the recombination of the impact ionized holes with the background, channel, and the travelling space charge electrons. The range of the electron temperatures obtained indicate that the contribution to the light emission from the high field domain electrons increases with reducing sample lengths.

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