

NANOSTRUCTURE BASED ON THE ALSB/INAS(1-X)SBX/ALSB DEEP QUANTUM WELLS USED FOR THE TWO-BAND SUPERLINEAR LUMINESCENCE

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Abstract

The superlinear electroluminescence (SLEL) of the MOVPE structures based on AISb/InAs(1-x)Sbx/AISb deep quantum wells (QWs) will be presented. Two samples differing in the InAsSb active layer composition were prepared. Dependence of the electroluminescence spectra and optical power on the drive current in nano-heterostructures with a deep AISb/InAs(1-x)Sbx/AISb QW in 77-300 K temperature range was measured. Intensive two-band SLEL in the 0.5-0.8 eV photon energy range and optical power enhancement with the drive current at RT caused by the contribution of the additional electron-hole pairs, generated at AISb/InAsSb interface, due to the impact ionization by the electrons heated at the high energy difference between AISb and the first electron level E_{e1} in the InAsSb QW, were found. This work is a continuation of our recent paper¹ devoted to the SLEL properties of the similar QWs, but the structure was grown with different type of interfaces between AISb barrier and InAsSb QW. In our previous work the interfaces were grown as AlAs-like, while results presented here are measured on samples with InSb-like interfaces between barriers and QW. We have observed an intensive two-band SLEL and have we described the temperature dependence in the range 77-300 K.

Keywords: InAsSb, MOVPE, quantum wells, superlinear luminescence

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