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Title

Terahertz dual-wavelength quantum cascade laser based on GaN active region

Source

PTICS AND LASER TECHNOLOGY, vol.44, no.2, MAR 2012 , 378-383. Publisher: Elsevier Ltd

Abstract

In this paper a novel terahertz (THz) quantum cascade laser (QCL) based on GaN/AlGaN quantum wells has been proposed, which emits at two widely separated wavelengths 33 and 52 mu m simultaneously in a single active region. The large LO-phonon energy (similar to 90 meV), the ultrafast resonant phonon depopulation of the lower radiative levels, suppression of the electrons that escape to the continuum states and selective carrier injection and extraction all together lead to a considerable enhancement in the operating temperature of the structure. All calculations have been done at a temperature of 265 K. Moreover, similar behavior of the output optical powers is another remarkable feature, which makes both wavelengths useful for special applications. 