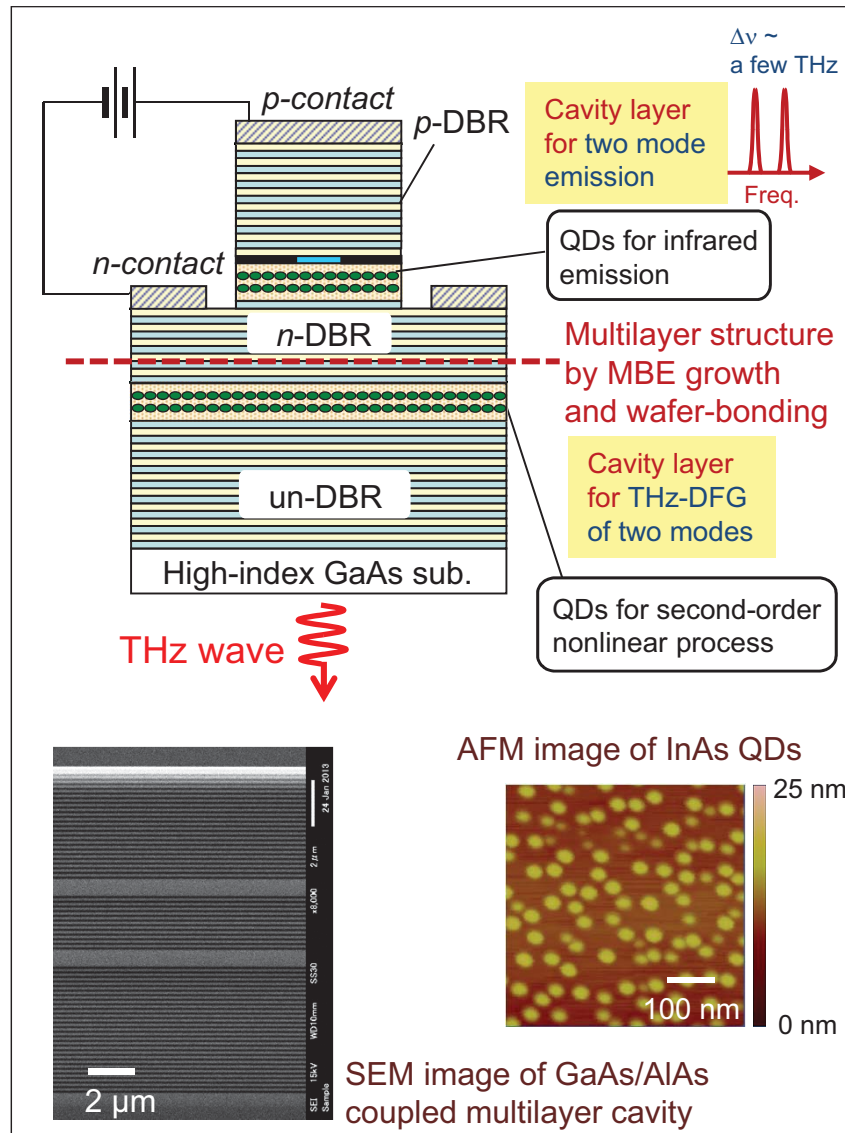


THz Emission Devices Based on Coupled Multilayer Cavity

Associate Professor Takahiro Kitada



Content:

Terahertz (THz) sources have been widely investigated due to the wide range of possible application, such as wireless communication, spectroscopy, and imaging. We have studied novel planar-type THz emission devices based on a coupled multilayer cavity.

The coupled multilayer cavity structure consists of three GaAs/AIAs distributed Bragg reflector (DBR) multilayers and two cavity layers containing self-assembled InAs quantum dots (QDs). The QDs in the top-side cavity with a pin junction are responsible for two mode emission in the infrared region, while the QDs in the bottom-side cavity on a high-index GaAs substrate allow difference frequency generation (DFG) of two cavity modes in the THz region. The coupled cavity structure should be fabricated by face-to-face bonding of two epitaxial wafers grown by molecular beam epitaxy (MBE) to produce a strong THz emission. The proposed planar-type device is very useful because it can emit monochromatic THz wave by current injection at room temperature.

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E-mail: kitada@frc.tokushima-u.ac.jp

Tel. +81-88-656-7671

Fax: +81-88-656-7674

HP : <http://www.frc.tokushima-u.ac.jp/frc-nano/index.html>

