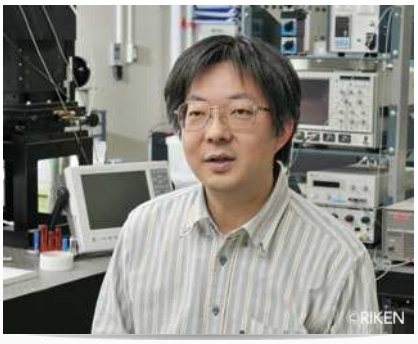
Terahertz Quantum Device Research Team

Team Leader
Hideki Hirayama D.Eng.



Publications 2013

CONTACT

hirayama@riken.jp ACCESS

Terahertz Quantum Device Research Team,
RIKEN Center for Advanced Photonics

#W526 5F Cooperation Center,
2-1 Hirosawa, Wako, Saitama
351-0198 Japan

TEL: +81-(0)48-467-9389
FAX: +81-(0)48-462-4647

RELATED LINKS

Laboratory on RIKEN Website
Terahertz Quantum Device Research Team | RIKEN

Archive
Terahertz Quantum Device Team | RIKEN Advanced Science Institute

Research information prior to FY2012, please refer to the above archive.

Outline

We develop advanced terahertz emitting and sensing devices based on inter sub-band optical transition of semiconductor quantum cascade structures. Firstly, we design and fabricate novel quantum cascade superlattice (SL) structures for high-efficiency terahertz transitions and develop terahertz quantum cascade laser (QCLs) with frequency range between 1-100 THz. We also develop high-sensitivity terahertz-wave detectors and terahertz-infrared (IR) light modulators using inter sub-band absorption of quantum wells. We hope through this research to construct what will become the base of the next-generation advanced terahertz imaging system.

Fields
Semiconductor Engineering, Applied Physics

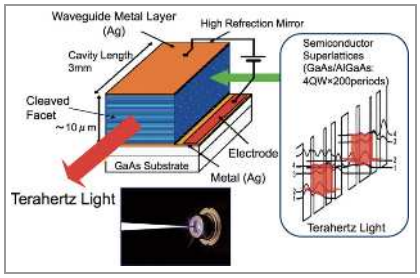
ABOUT RAP
LABORATORIES
Extreme Photonics Research Group
Attosecond Science Research Team
Ultrafast Spectroscopy Research Team
Live Cell Super-Resolution Imaging Reseach Team
Biotechnological Optics Research Team
Space-Time Engineering Research Team
Image Processing Research Team
Innovative Photon Manipulation Research Team
Cloud-Based Eye Disease Diagnosis Joint Research Team
RIKEN-SIOM Joint Research Unit
Terahertz-wave Research Group
Tera-Photonics Research Team
Terahertz Sensing and Imaging Research Team
Terahertz Quantum Device Research Team
Advanced Photonics Technology Development Group
Photonics Control Technology Team
Ultrahigh Precision Optics Technology Team
Neutron Beam Technology Team
Advanced Manufacturing Support Team
PRESS RELEASES
NEWS
EVENTS
ACCESS & CONTACT

Keywords

semiconductor superlattice, quantum cascade laser, intersubband transition, nitride semiconductor, MBE crystal growth

Subjects

1. Research toward the realization of higher temperature operation of QCL
2. Research toward the realization of 5-12 THz-band QCL using nitride semiconductors



Structure of THz quantum -cascade laser

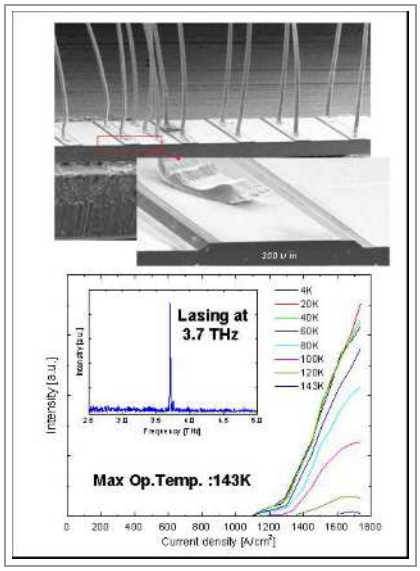


Image and device property of GaAs/ AlGaAs THz quantum cascade laser

Link
Preparing for RIKEN Wako

ARCHIVES

Extreme Photonics Department, RIKEN Advanced Science Institute

RIKEN Center for Advanced Photonics
2-1 Hirosawa, Wako, Saitama 351-0198 Japan
TEL: +81-(0)48-462-1111 / FAX: +81-(0)48-462-1554