

Quantum Cascade Laser Power Scaling Developments

Speaker: Jeffrey Shattuck - Forward Photonics, Wilmington, MA

E-Mail: JeffShattuck@forwardphotonics.com

Abstract

Quantum cascade laser using wavelength beam combination (WBC) technology enables commercialization of mid-infrared laser modules with an order of magnitude more power than is otherwise available. We will review our latest mid-wave infrared (MWIR) laser capable of producing > 20 W in CW operation by using WBC to combine the outputs of individual high power QCLs. We will also review development of QCL array technology which would serve to shrink the size and weight of the current laser by a vast amount.

It is well known in industry of the cumbersomeness involved with the need of liquid based cooling system in packaging for dealing with the waste heat in these high powered QCL systems. Without adequate cooling in packaging, thermal induced mechanical stress is a leading mode of failure in QCLs. With this in mind, we has developed a fully air-cooled version of its WBC based MWIR laser. Such a system will provide great benefits in applications where liquid cooling is simply untenable.

Biography

Dr. Jeffrey Shattuck is a project manager at Forward Photonics of Wilmington, MA and has been with the company for over 2 years. He received his Ph.D. in physical chemistry from Boston University in 2013 performing ultrafast infrared spectroscopy in the lab of professor Lawrence Ziegler.