

Integration of III-V Quantum Dot Lasers and Their Advanced Applications

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Abstract

In this talk, we will discuss the recent work in InAs quantum dot lasers in the University of Massachusetts Lowell. Due to the three-dimension confinement in quantum dot (QD) heterostructures, InAs QDs show unique properties, such as high operation temperature and broadband emission, compared to their quantum well (QW) counterparts. It makes InAs QDs ideal candidates for several key areas. In this context, we will discuss several applications of the quantum dot lasers, including, broad-band swept source lasers for optical coherent tomography, silicon photonics integrations for optical interconnections, parity-time symmetry laser, and topological edge state lasers. The details of the QD laser design, growth and characterizations will be discussed.

Short Bio: Dr. Wei Guo received his PhD in electrical engineering from Brown university, Providence, RI, and is currently an assistant professor in physics at the university of Massachusetts Lowell, Lowell, MA. He has co-authored over 30 papers in peer-reviewed journals with III-V nanostructured materials, such as InAs QDs and InGaN nanowires. He currently the lead of the Photonics Research Laboratory at UML.