

Optical method for studying heating effects in IV-VI semiconductor materials

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Abstract

Room temperature photoluminescence (PL) measurements of IV-VI semiconductor laser materials grown on silicon substrates by molecular beam epitaxy were used to extract epilayer lattice temperatures. Measurement of IV-VI materials transferred to copper showed a 20°C reduction in temperature indicating a significant improvement in epilayer heat dissipation. PL experiments using two different pumping wavelengths, 0.91 μm and 2.5 μm , were also performed. Lattice temperatures calculated from PL spectra were approximately 22°C lower for 2.5 μm pumping as compared to 0.91 μm pumping indicating much less optical heating from the 2.5 μm pump laser.