



Seminarankündigung

**Dienstag, 15. Januar 2013
17:15 Uhr**

WSI, Seminarraum S 101

“High performance Interband Cascade Lasers in the 3-6 μm range”

Several applications like medical diagnostics, free space communication and high sensitivity tunable laser absorption spectroscopy (TLAS) demand compact and robust laser sources in the mid infrared region. Particularly the window from 3 to 6 μm is of great interest for TLAS, since many organic molecules have strong rotational-vibrational absorption lines in this so called fingerprint region. A very promising source for this spectral region is the interband cascade laser (ICL). This device relies on the special band alignment in the InAs/GaSb/AlSb material system that allows the combination of (spatially indirect) interband transitions with tunnel junctions for carrier conversion, enabling cascaded active regions. Within the last years, the performance of ICLs has improved significantly, and continuous wave operation over a wide wavelength range has been demonstrated even at elevated temperatures. I'll present several design optimizations of the layer sequence and the doping scheme that were made to reduce the photon losses and increase the external efficiency. As a result, the threshold current densities for broad area lasers could be reduced below $100\text{A}/\text{cm}^2$. Narrow ridge waveguide laser operate up to 60°C in continuous wave mode and emit more than 20 mW of optical power at 20°C .

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