

Demonstration of a Semiconductor Double Microring Resonator Coupled Laser

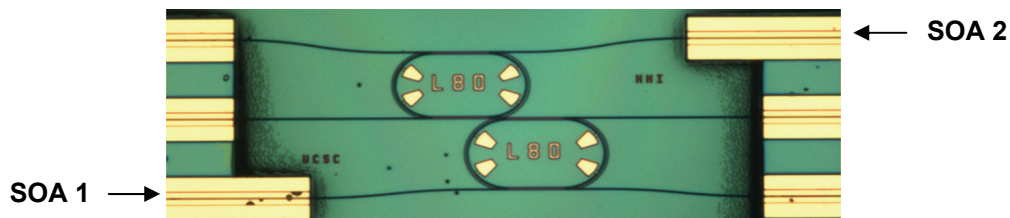
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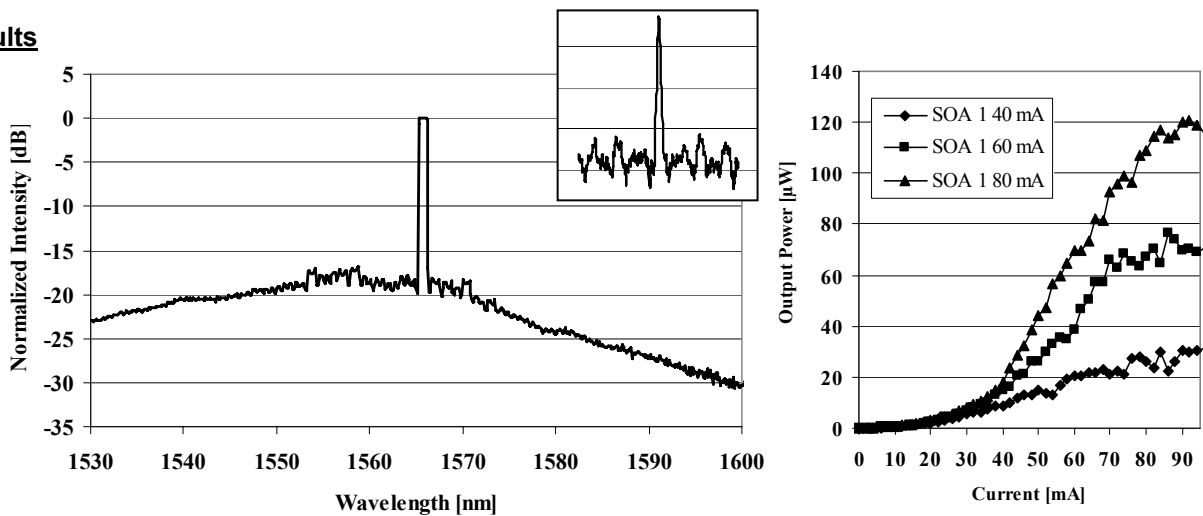
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Abstract

A single mode GaInAsP-InP double microring resonator coupled laser is demonstrated for the first time. The laser has an output power of 0.12 mW with a sidemode suppression ratio of 30 dB.



Results



The ring resonators have a slightly different radius to increase the free spectral range (FSR) and to achieve a single mode operation. The radii of the rings are 100 μm and 108 μm , which leads to a FSR of about 15 nm. The resonance wavelength of the rings can be tuned by the integrated platinum resistors on top of the passive waveguides in the ring resonators. The coupling between the bus waveguides and the ring resonators is realized by a codirectional coupler with a length of 500 μm and a coupling gap of 1 μm . The achieved splitting ratio is 3 dB. The laser cavity consists of SOA 1, SOA 2 (Fig. 1) and the two ring resonators. The remaining SOAs are used as absorbers.

Literature

- [1] Z. Bian, B. Liu, A. Shakouri, "InP-Based Passive Ring-Resonator-Coupled Lasers," *IEEE J. Quantum Electron.*, 39, 859-865 (2003).
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- [3] D. G. Rabus, Z. Bian, Ali Shakouri, "A GaInAsP/InP Double Ring Resonator Coupled Laser," accepted for publication in *IEEE Photon. Technol. Lett.*, September 2005.

The DR-RCLs have been fabricated at Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut (HHI) in Berlin. D. G. Rabus thanks HHI for supporting him in realizing the devices, especially H. Heidrich and his group members.