

Single-Mode Tunable Interband Cascade Lasers with a Wide Tuning Range

Jingli Gong,¹ Zhanyi Wang,¹ Jian-Jun He,¹ Rui Q. Yang^{2,+}

¹ State Key Laboratory of Modern Optical Instrumentation, College of Optical Science and Engineering, Zhejiang University, Hangzhou, China 310027

² School of Electrical and Computer Engineering, University of Oklahoma, Norman, OK USA 73019.

Type-II interband cascade lasers (ICLs) [1,2] are efficient and compact mid-infrared light sources with many applications such as gas sensing and environmental monitoring. Here, we report the demonstration of single-mode tunable ICLs with a wide tuning range based on V-coupled cavity [3,4]. By optimizing the coupling coefficient and the cavity structure design, the tuning range of V-coupled cavity single-mode ICLs is significantly extended with a side mode suppression ratio (SMSR) exceeding 37 dB in continuous wave operation near 3.4 μm . At a fixed temperature, a tuning range of up to 97 nm has been demonstrated. By combining two temperatures at 82K and 100K, a total tuning range of about 150 nm has been achieved, as shown in Fig. 1. The total tuning range exceeded 150 nm when operation temperature extended to 110K. More details and updated results will be presented at the conference.

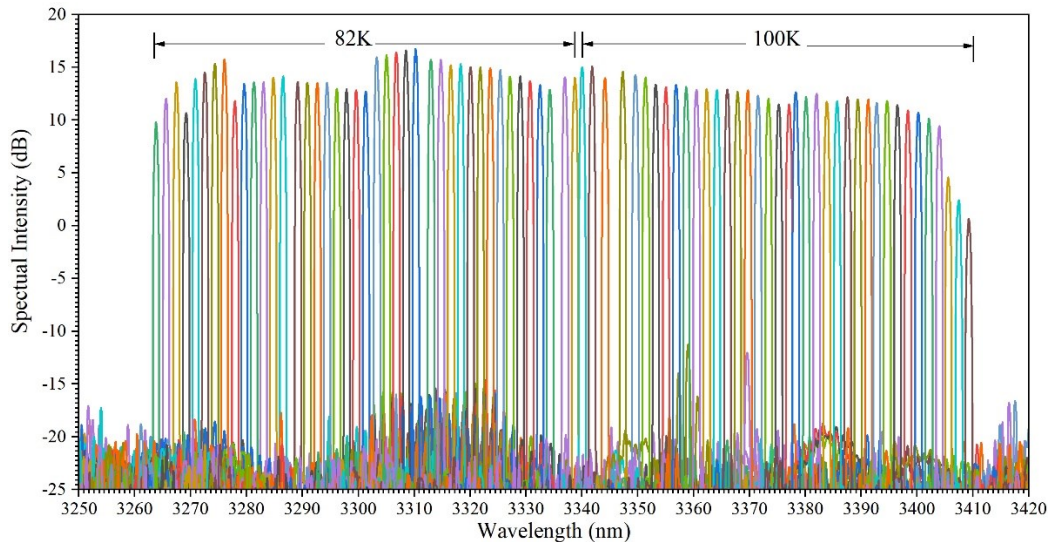


Fig. 1 CW emission spectra of a V-coupled cavity ICL with a total tuning range of 150 nm.

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⁺ Author for correspondence: Rui.q.Yang@ou.edu