Abstract Submitted
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Recovering semiconductor lasers from coherence collapse by orthogonal-polarization optical feedback[1] TSU-CHIANG YEN, Dept. of Physics, National Sun Yat-sen University, Taiwan, R.O.C., DA-LONG CHENG, Dept. of Electronics Engineering and Computer Science, Tung Fang Institute of Technology, Taiwan, R.O.C. — A coherent optical feedback (COF) greater than around -30 dB will generally conduct a single-mode semiconductor laser to the coherence collapse that present a multimode oscillation and high-level intensity noise in the laser's output. This research employed orthogonal-polarization optical feedback (OPF) to recover semiconductor lasers from coherence collapse, induced by strong COF, to the solitary single-mode state. Experimentally, under a COF as strong as -14 dB, an OPF of -29 dB could recover the laser's primitive single-mode state from multimode. Moreover, a pre-fed OPF of around -25 dB provided the semiconductor laser with a resistivity against up to -19 dB COF. These results will significantly improve the performance of semiconductor lasers in many applications and provide a new method to investigate the coherence collapse.

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