

Abstract Submitted
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Effect of optical feedback on high frequency current-driven polarization switching of vertical-cavity surface-emitting lasers¹ WANG-CHUANG KUO, CHUAN-PI HSU, Department of Physics, Natl Sun Yat-Sen University, DA-LONG CHENG, Department of Computer and Communication, SHUTE University, WEI CHANG, TSU-CHIANG YEN, Department of Physics, Natl Sun Yat-Sen University — In vertical-cavity surface-emitting lasers (VCSELs) which exhibit polarization switches (PS) in L-I curves, the current-driven polarization switch (CDPS) has been studied extensively, and a cutoff frequency of 90 kHz constrained by the bandwidth of thermal response was reported. In this research, the CDPS with high frequency current modulation and optical feedback were experimentally and theoretically investigated. The experimental results reveal that, with the assistance of polarization-selective optical feedback of about -15 dB, the cutoff frequency of the CDPS could be raised to 50 MHz. A set of rate equations was employed to simulate the enhancement of CDPS and to address the interaction of optical feedback with the PS. These results will help to extend the application of CDPS to even higher frequency.

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Wang-Chuang Kuo
Natl Sun Yat-Sen University

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