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Thermal Properties of Polarization Switching in Vertical-Cavity Surface-Emitting Lasers YU-HENG WU, YUEH-CHEN LI, WANG-CHUANG KUO, TSU-CHIANG YEN, Department of Physics, National Sun Yat sen University — This investigation studied the thermal properties of the polarization switching (PS) in vertical-cavity surface-emitting lasers (VCSELs). The studies were performed by experiments. In experiments, the current modulation frequency and ambient temperature of VCSELs were varied to study their thermal effects on PS. The hysteresis loop of polarization switching broadens as the modulation frequency increased and narrows as the modulation frequency decreased. We assumed that PS is activated as the temperature in the active region reaches a certain temperature. The PS of the VCSEL controlled by continuously varied ambient temperature is also studied. The experiments results show that the thermal effect plays a major role in PS and the hysteresis of PS. These results contribute to the understanding of the mechanism of VCSEL's polarization switching.

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