

Abstract Submitted  
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**Temporal evolution of high-order transverse modes in a multi-mode VCSEL induced by a beam-profile optical feedback** CHUAN-PI HSU, DA-LONG CHENG, WANG-CHUANG KUO, TSU CHIANG YEN — This work studied the dynamics of the transverse modes in a multitransverse mode VCSEL when the laser was conducted to lase the fundamental transverse mode by a Gaussian-beam-profile optical feedback. The multitransverse-mode beam profile of the solitary VCSEL was emitted into a single-mode fiber to achieve the Gaussian-beam-profile optical feedback. Afterward, a quasi-Gaussian beam fed back into the cavity of laser. The feedback beam irradiated on the facet of the fundamental mode of the laser chip, the photons were stimulated to lase and contribute to the fundamental transverse mode. Some high-order transverse modes were observed out of the above mentioned area. The interaction and evolution between the high-order modes and the fundamental mode of the VCSEL could be controlled by the spot of the feedback beam on the facet of laser. More experimental details will be presented and these results will help to expand the application of VCSELs.

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