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Review on Single-Mode Vertical-Cavity Surface-Emitting Lasers for High-Speed Data Transfer

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Abstract. Vertical-cavity surface-emitting lasers (VCSELs) are wide-spread laser sources for different applications in optical communication and sensing. The evolution of fabrication processes and new technological approaches allow to obtain high-Q single-mode VCSELs with data rates more than 100 Gbps. This review discusses basic designs and construction features of VCSELs that effect on their applications. The advances over the past 20 years for single-mode VCSELs of 850 nm, 1300 nm and 1550 nm wavelength ranges are presented.

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