

Theoretical analysis of a multi-stripe laser array with external off-axis feedback

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Abstract

We investigate the dynamical properties of broad area lasers with a V-shaped external cavity formed by two off-axis feedback mirrors that allow to select a single transverse mode with transversely modulated intensity distribution. We derive and study a reduced model of a multi-stripe array. Bifurcation analysis of this system reveals the existence of single mode and multimode instabilities leading to a periodic and irregular time dependence of the output intensity. We observe within reduced model the multimode instability leading to a periodic regime, where the fields traveling in the opposite directions oscillate in antiphase. This result is in agreement with that obtained with the help of 2+1 dimensional traveling wave model.