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# New Characteristics of Blue Self-pulsating InGaN Lasers

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## Abstract

In this paper, we present results of numerical calculations on the influence of blue light laser parameters on self-pulsation regimes. The adopted Yamada model to InGaN laser is used for numerical calculations. We start our investigations presenting the dependence of output power on the injected current. A threshold current of 90mA is obtained. We use the bifurcation analysis to plot the lines of Hopf - bifurcation in the plane of different parameters. The region of self-pulsation in the plane differential amplification coefficient injected current is obtained. The region of self-pulsation is wide and appears for large values of injected current. We studied also the influence of the thickness of the saturation absorber, the length of the laser, as well as the lifetime of the charge carriers on the self-pulsation region in terms of several parameters. The region of self-pulsations for different values of the reflection coefficient of the back facet of the laser is obtained. The higher reflectivity implies the wide self-pulsation region. Finally, we calculated the lines of the same frequency in the plane of laser length – injected current. We also report the regions of pulsations with higher frequency.

*Keywords: self-pulsations, bifurcations, blue lasers, saturable absorbers*

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