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Comparison of mode thresholds in microdisk and microring lasers with uniform and non-uniform gain profiles

Zolotukhina A., Spiridonov A., Karchevskii E.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016 IEEE. We study the modes of two-dimensional (2-D) microdisk and microring lasers using the electromagnetic theory, namely considering them as dielectric resonators with ring-like active regions having radially non-uniform gain profile. On the approximation of the gain profile with a stepped function, we reduce the considered eigenvalue problems to transcendental equations and solve them numerically. Finally we compare the spectral characteristics, i.e. the lasing frequencies and the associated values of threshold material gain, of these resonators with previously obtained solutions for resonators with uniform gain profile.

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Keywords

laser resonators, lasers, lasing modes, microdisk, microring, non-uniform gain, threshold of lasing, uniform gain