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Optimization of a passively Q-switched Nd:YAG laser with a saturable absorber characterized by excited state absorption (ESA)

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Keywords

solid state lasers, passive Q-switching, saturable absorber, numerical simulation

Abstract

Mathematical description of a passively Q-switched laser and the way it works are presented. Both theoretical and experimental model of this laser have been worked out. Moreover, numerical analysis of saturable absorber influence on laser efficiency was made. It is the saturable absorber characterized by excited state absorption (ESA) that has been taken into account. The optimization procedure points to the optimal circumstances of the laser system considered. The results obtained numerically are in very good agreement with those achieved experimentally.



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