

The transient analytical solutions of temperature distribution, stress, strain and optical path difference in convectional cooled end-pumped laser rod are derived. The results are compared with other works and good agreements are found. The effects of increasing the edge cooling and face cooling are studied. It is found that an increase in the edge cooling has significant effect on reducing the maximum temperature that can be reached in the laser rod but it has no effect on the value of optical path difference. It is also found that increasing this type of cooling significantly reduces the time required to reach the thermal equilibrium with a slight increase in the max. tensile hoop stress that can be reached as the cooling increases. On the other hand, increase in face cooling reduces the response time, optical path difference and the maximum temperature that can be reached in the laser rod but a significant increase in the max. tensile hoop stress is observed. A matching between the advantages of these two type of cooling may be useful for a designer