

Abstract Submitted
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Optical Characteristics of Nd-doped PLZT Ceramic Laser Materials at Different Temperatures and Nd Concentrations¹ PI LING HUANG, ANDREW DUROCHER², XUESHENG CHEN, Department of Physics and Astronomy, Wheaton College, Norton, MA 02677 — The neodymium ion (Nd^{3+}) doped PLZT, is a newly developed transparent ceramic laser material that possesses great potentials for making high-power and high-efficient lasers. A major focus in this research is to investigate temperature and Nd^{3+} concentration dependence of absorption of this material in the wavelength range from 600 to 900 nm. The samples investigated are 0.5% and 1% Nd doped PLZT's, each being 1 mm thick; temperature of the sample is being controlled at several chosen temperatures from 30 to 300K. The absorption peaks are found to be narrow, thus distinguishable at low temperature, but the lines are broadened as temperature increases. The absorption intensity and peaks can also change with temperature. The absorption peaks reveals what wavelengths the materials absorb well, which is critical in determining what kinds of pump light sources to use. This research provide critical information on choosing appropriate critical parameters such as temperature and concentration for the development of high-efficiency lasers with this new kind of the transparent ceramic laser materials, Nd^{3+} :PLZT. Results and conclusions will be presented in details at the meeting.

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