Appl. Phys. A 54, 404–410 (1992)

Applied Physics A Solids and Surfaces

Time-Resolved Spectra of Excited-State Absorption in Er^{3+} Doped $YAlO_3$

M. Pollnau, E. Heumann, and G. Huber

Institut für Laser-Physik, Universität Hamburg, Jungiusstrasse 11, W-2000 Hamburg 36, Fed. Rep. Germany

Received 9 October 1991/Accepted 21 February 1992

Abstract. A pump- and probe-beam technique is used for measuring time-resolved excited-state absorption (ESA) and stimulated-emission (SE) spectra of Er^{3+} doped $YAlO_3$. The Er^{3+} $^4I_{15/2} \rightarrow {}^4F_{7/2}$ transition of the sample is excited at 488 nm by an excimer laser pumped dye laser. The ESA and SE of broadband xenon flashlamp light is monitored between 300 and 860 nm by an optical multichannel analyzer (OMA). The analysis of the experimental results provides information on the effective cross sections σ_{ESA} and σ_{SE} originating from several levels and on the populations of these levels. To our knowledge this represents the first detailed investigation of time-resolved ESA and SE over a broad spectral range in rare-earth doped materials.

PACS: 07.65, 35.00, 42.55 R