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Rare-earth doped chalcogenide thin films for optoelectronic applications by laser ablation PRABHAT DWIVEDI, T. ALLEN, T.J. CLEMENT, Y.Y. TUSI, C.J. HAUGEN, R.G. DECORBY, J.N. MCMULLIN, ECE Department University of Alberta and TRLabs, 7th Floor, 9107 116 St. N.W., Edmonton, AB, Canada T6G 2V4, S.O. KASAP, EE Department, University of Saskatchewan, Saskatoon SK, Canada S7N 5A9, S. O KASAP COLLABORATION — Chalcogenide glasses have been extensively studied as host media for rare-earth (RE) doped photonic devices due to potential application as optical amplifiers for optical telecommunication. However, fabrication of RE doped homogeneous thin films of chalcogenide glass systems is a difficult task. Doping high amounts of RE atoms (1 to 2 at%) using conventional preparation methods such as glass quenching or physical vapor deposition techniques often results in physical or chemical clustering of the RE atoms in the glass matrix also. In this paper, we report the deposition and properties of RE doped chalcogenide films fabricated by pulsed laser deposition (PLD), using 15 ns KrF laser pulses at various laser energy densities and substrate temperatures. We examined the effects of changing the substrate temperature during deposition on the optical constants and photoluminescence. The thermal stability was examined using a temperature modulated differential scaning calorimetry (TMDSC) measurements.

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