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Characterization of Er^{+3}:Y_2O_3 films made via Atomic Layer Deposition NICHOLAS BECKER, Illinois Institute of Technology, THOMAS PROSLIER, JEFFREY KLUG, Argonne National Laboratory, JOHN ZASADZINSKI, Illinois Institute of Technology, JEFFREY ELAM, Argonne National Laboratory, CARLO SEGREY, Illinois Institute of Technology, TIGRAN SANAMYAN, MARK DUBINSKIY, Army Research Laboratory, MICHAEL PELLIN, Argonne National Laboratory — Er^{+3}:Y_2O_3 thin films with spatially-controlled Er^{+3} ion incorporation, were deposited on various substrates using Atomic Layer Deposition. By systematically varying the Erbium precursors used in the deposition of the films, a method to spatially control the Erbium has been realized. All films were polycrystalline as deposited and no appreciable change was detected after post-deposition annealing. Emission spectra for all precursors used show crystalline emission lines, similar to those grown via a melt process. Photoluminescent lifetimes up to 6.5ms have been recorded from these films, the largest to date in films deposited with Atomic Layer Deposition. Films have been characterized using XRD/GIXRD, UV-Vis spectroscopy, XAFS, RBS, HFS, SEM, TEM, and AFM. The results of these various measurements, and the influence on photoluminescent lifetime will be discussed.

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