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Growth and characterization of transition metal oxide thin films by dual ion beam sputtering ERIK KROUS, PETER LANGSTON, DINESH PATEL, FEDERICO FURCH, BRENDAN REAGAN, JORGE ROCCA, CARMEN MENONI, Colorado State University, ASHOT MARKOSYAN, ROGER ROUTE, MARTY FEJER, Stanford University, LUKE EMMERT, DUY NGUYEN, WOLFGANG RUDOLPH, University of New Mexico — The development of high power lasers operating in the near infrared heavily relies on the availability of robust optical coatings. We present results on the growth and characterization of transition metal oxide thin films by dual ion beam sputtering. Single layer films are grown under different conditions and characterized for their structural, chemical and optical properties using glancing angle x-ray diffraction, variable angle spectroscopic ellipsometry, x-ray photoelectron spectroscopy, photothermal commonpath interferometry, laser-induced damage threshold studies and atomic force microscopy. The laser damage threshold for single pulse (1-on-1) and multiple pulses (S-on-1) has also been measured. The results of these experiments have revealed the important role that native impurities and laser created excitonic effects have on the optical response of the single layer films. Results on interference coatings with superior performance will also be presented.

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