

Abstract Submitted
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Interference coatings for 1-2 μm high energy lasers by reactive ion beam sputtering¹ TRAVIS DAY, DREW SCHILTZ, CORY BAUMGARTEN, BRENDAN REAGAN, DINESH PATEL, JORGE ROCCA, CARMEN MENONI, Colorado State University — The development of Joule-level chirped pulse amplification solid state diode pumped laser systems with numerous scientific and technological applications motivates our work in interference coatings for operation in the 1-2 μm wavelength range. Interference coatings were designed using a combination of metal-oxides, and were grown by ion beam sputtering. Results will be presented on 1 μm coatings based on Ta₂O₅/SiO₂ in which by modifying the top few layers it is possible to achieve a laser damage fluence 2x that of a quarter wave Ta₂O₅/SiO₂. Results will also be presented on interference coatings designed with metal oxides for 1.6-2 μm operation. At-wavelength testing of the laser damage resistance of these coatings showed they can withstand fluences similar to that of the high quality infrared fused silica substrates when tested with a train of pulses of 2 picosecond duration. Work supported by the DoD Office of Naval Research, the Army Research Office and the High Energy Laser Program of the DoD Joint Technology Office.

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