

Abstract Submitted
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Laser cleaning of ITER's diagnostic mirrors¹ C.H. SKINNER, C.A. GENTILE, PPPL, R. DOERNER, UCSD — Practical methods to clean ITER's diagnostic mirrors and restore reflectivity will be critical to ITER's plasma operations. We report on laser cleaning of single crystal molybdenum mirrors coated with either carbon or beryllium films 150 - 420 nm thick. A 1.06 μm Nd laser system provided 220 ns pulses at 8 kHz with typical power densities of 1-2 J/cm². The laser beam was fiber optically coupled to a scanner suitable for tokamak applications. The efficacy of mirror cleaning was assessed with a new technique that combines microscopic imaging and reflectivity measurements [1]. The method is suitable for hazardous materials such as beryllium as the mirrors remain sealed in a vacuum chamber. Excellent restoration of reflectivity for the carbon coated Mo mirrors was observed after laser scanning under vacuum conditions. For the beryllium coated mirrors restoration of reflectivity has so far been incomplete and modeling indicates that a shorter duration laser pulse is needed. No damage of the molybdenum mirror substrates was observed.

[1] C.H. Skinner et al., Rev. Sci. Instrum. at press.

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