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Evaluation of a Non-Destructive Method for the Removal of Dust, Debris, and Co-deposited Tritium from First Wall Surfaces and Plasma Surface Interfaces (PSI) in a Fusion Reactor[1] CHRISTINA MCGAHAN, Gettysburg College, CHARLES GENTILE, Princeton University — Diagnostic mirrors and windows located within the vacuum vessel boundary of fusion reactors will be subjected to dust and debris collection, causing reflectivity and clarity respectively to degrade and thus undermining data accuracy and machine performance. Additionally, co-deposited tritium must be removed in an efficient manner so unexpended tritium can be re-introduced into the fusion fuel cycle. A technique for removing carbon, beryllium, and co-deposited tritium from first wall components using a rastering 325 watt continuous wave neodymium-doped yttrium aluminum garnet (Nd: YAG) laser is under investigation. This technique has shown promise in ablating dust and debris without damaging reflective surfaces in addition to removing co-deposited layers of tritium from various diagnostic and PSI components in a non-destructive fashion. We will discuss the physical effects on surfaces and components pre and post laser interaction(s).

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