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Effectiveness of ELM mitigation techniques in reducing tungsten erosion rates during ELMs[1] ALEC CACHERIS, University of Tennessee at Knoxville , TYLER ABRAMS, ANDREA GAROFALO, General Atomics , EZEKIAL UNTERBERG, LARRY BAYLOR, ORNL, OLIVER SCHMITZ, University of Wisconsin — The intense heat and high-density particle bursts on the plasma-facing components (PFCs) of a tokamak that occur during edge localized modes (ELMs) may be the most challenging plasma-materials interaction issue for ITER. ELMs in high confinement mode (H-mode) plasmas erode PFCs and lead to impurities in the core, reducing confinement. ITER must understand the level of material erosion caused by ELMs and develop solutions to mitigate their effects. We analyze erosion that occurred to tungsten (W) PFCs during the Metal Rings Campaign (MRC), in which tungsten-coated tiles were installed in the DIII-D divertor for three weeks in summer 2016. From these data, the effectiveness of ELM mitigation techniques, including resonant magnetic perturbations, pellet pacing, and QH-mode, in reducing (W) erosion rates during ELMs is evaluated. Standard D-alpha and WI filterscope channels were used to detect ELM start times and to infer the gross erosion rate of the tungsten PFCs respectively. The data obtained from these filterscopes are also compared to simulations of the 'free-streaming plus recycling model' to assess validity of the model to extrapolate results and predictions to future tokamaks such as ITER.

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