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Prompt Gas Desorption Due to Ion Impact on Accelerator Structures[1] SAGAR VIJAY, LBNL and Princeton University, PETER A. SEIDL, ANDY FALTENS, STEVEN M. LIDIA, LBNL — The repetition rate and peak current of high intensity ion accelerators for inertial fusion or other applications may be limited under certain conditions by the desorption of gas molecules and atoms due to stray ions striking the accelerator structure. We have measured the prompt yield of atoms in close proximity to the point of impact of the ions on a surface. Using the 300-keV, K+ ion beam of the Neutralized Drift Compression Experiment (NDCX-I), ions strike a metal target in a 5-10 microsecond bunch. The collector of a Bayert-Alpert style ionization gauge is used to detect the local pressure burst several centimeters away. Pressure transients are observed on a micro-second time scale due to the initial burst of desorbed gas, and on a much longer ($\sim$1 second) timescale, corresponding to the equilibration of the pressure after many "bounces" of atoms in the vacuum chamber. We report on these time dependent pressure measurements, modeling of the pressure transient, and implications for high-intensity ion accelerators.

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