## Abstract Submitted for the DPP19 Meeting of The American Physical Society

Optimization of laser-driven ion acceleration from microstructured targets by PIC simulations including ionization processes<sup>1</sup> BIANCA MONIQUE LUANSING, University of California, Berkeley and Center for Energy Research, University of California, San Diego, DAIKI KAWAHITO, MATH-IEU BAILLY-GRANDVAUX, FARHAT BEG, Center for Energy Research, University of California, San Diego — The development of laser technology has enabled the use of high laser intensities  $(>10^{21} \text{ W/cm}^2)$  to enhance ion acceleration. With the addition of micro-structure targets (tube, pillar) at the target film front-side, accelerated ion energy increases with the laser self-focusing as a result of structure guiding. However, this acceleration is limited by the structure-preserving time since the irradiated laser field is shattered after the plasma expansion of the front structures. To find the optimized parameter for the ion acceleration, we calculated the laser interaction with the micro-structured target by using the Particle-In-Cell (PIC) code EPIC, which includes field and impact ionization processes. This modeling showed the detailed acceleration mechanism and parameter dependence of the accelerated ion energy on the structure size  $(\mu m)$  and laser pulse width (fs).

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