

Abstract Submitted
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Laser ablation loading of Yb+ ions in a surface trap¹ YUHI AIKYO, GEERT VRIJSEN, ROBERT S. SPIVEY, VOLKAN INLEK, JUNGSANG KIM, Duke University — We demonstrate and characterize laser ablation loading of Yb+ ions in a surface trap. Ablation loading holds several advantages over traditional thermal ovens. The lack of required heat source makes it possible to use ablation loading in cryogenic systems. Additionally, the pulsed nature of the system can provide loaded ions much more quickly and reliably. We ablate Yb atoms using a Q-switched Nd:YAG pulsed laser (1064 nm wavelength, 8 ns pulse length). Time-of-flight spectroscopy was performed to characterize temperature and stream velocity of the ablated atoms, as well as to determine and increase the number of trappable atoms produced as a function of ablation laser fluence. As a result, we achieved 56% successful trapping rate per pulse, or a mean number of 1.7 pulses per successful trapping attempt. This method of ablation loading into a surface trap will be used in a compact cryogenic ion trap system.

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