

Abstract Submitted  
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**Laser Ablation and Buffer-Gas Cooling of Alkali and Rare Earth Metals** WESLEY CAMPBELL, MAXWELL PARSONS, RUPAK CHAKRABORTY, JOHN DOYLE, Harvard University — We present studies of cold atomic vapors of Li, K, Cs, and Yb produced through pulsed laser ablation into 4 K helium buffer gas. The atomic ground state density of ablated species is monitored by laser absorption spectroscopy. We observe rapid thermalization of the atomic vapor to the temperature of the buffer gas and find that for Yb, the lifetime of the vapor matches a simple diffusion model. This is also true for Li up to a specific threshold in buffer-gas density. For K, Rb, and Cs, we see a short timescale loss that is inconsistent with diffusion to the cell walls. The diffusion cross section of Li is measured, allowing for the use of lithium as a “standard” gauge of buffer-gas density.

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