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Investigation of low-outgassing lithium sources for a portable cold-atom vacuum standard ERIC NORRGARD, Univ of Maryland-College Park, NIST, DANIEL BARKER, JAMES FEDCHAK, NIKOLAI KLIMOV, JULIA SCHERSCHLIGT, STEPHEN ECKEL, NIST — The aim of the Cold Core Technology Platform at NIST is to produce chip-scale sensors and standards based on cold atoms, including a device based on trapped cold atoms which is simultaneously a primary standard and an absolute sensor of vacuum. Translating these cold atom-based technologies into deployable sensors requires an atomic source which is scaleable, lightweight, and suitable for ultra-high vacuum. We present two potential atom sources for such applications. One, an alkali metal dispenser made from 3D-printed titanium, loads a Li magneto-optical trap (MOT) of 10ˆ7 atoms with a low outgassing rate. In a second application, atoms are loaded into a MOT by light-induced atomic desorption (LIAD) from the surface of a vacuum viewport. A MOT of roughly 10ˆ4 atoms was loaded in this manner while increasing the pressure in the vacuum chamber by less than 50%, or 2x10ˆ-10 torr. To our knowledge, this is the first observation of LIAD of Li.

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