

Abstract Submitted
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Optical depletion spectroscopy for probing evaporatively cooled OH¹ MATTHEW HUMMON, HAO WU, BENJAMIN STUHL², DAVID REENS, MARK YEO, JILA, University of CO, Boulder, JUN YE, JILA, University of CO, Boulder and NIST — Pulsed laser induced fluorescence (PLIF) measurements provide a sensitive probe for the detection of molecular species. However, the broad linewidth of the pulsed lasers used for molecular excitation obscures spectral information useful for determination of molecule temperature. This limitation can be overcome by the use of a second, narrowband source of radiation that can deplete a subset of the molecules detected using PLIF, and a high resolution depletion spectrum can be obtained. In the past, we have demonstrated the use of microwave depletion spectroscopy to measure magnetically trapped, evaporatively cooled OH temperatures in the range of 5-50 mK. The lower limit of 5 mK is set by the details of the microwave transition. Here we present temperature measurements of trapped OH using an optical depletion technique, which is in principle capable of probing temperatures as low as 50 microkelvin.

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