

Abstract Submitted
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The loss and dephasing of the excited state Sodium condensate¹

JIANING HAN², JQI, NIST, and University of Maryland, Gaithersburg, Maryland, 20899 — Two ways of characterizing the excited state condensate, the lifetime and Rabi oscillations, are applied to study the excited state condensate: F=2 condensate. One of the F=2 condensates, $|2, -2 \rangle$, $|2, -1 \rangle$ and $|2, 0 \rangle$, is created by directly driving the F=1 state in an all optical BEC by a microwave pulse. The difference in the aspect ratio of expanding condensates, released from the F=1 and F=2 states, has been observed. This difference is due to the different scattering lengths in these two states. The fast decay of the the F=2 signal indicates a coherent process followed by a collision process. In addition, we have studied the density dephasing of this system by the Rabi oscillations, and we have shown that t_0 , the damping time constant, depends linearly on the atomic density in the density range that we have studied. In addition, we have studied the density dephasing of this system by the Rabi oscillations, and we have shown that t_0 , the damping time constant, depends linearly on the atomic density in the density range that we have studied.

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