

Abstract Submitted  
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**Interactions between (8s-6d) and (7s-5d) wavepackets in Rb examined by parametric four-wave mixing** RUI SU, WILLIAM GOLDSHLAG, J. GARY EDEN, University of Illinois at Urbana-Champaign, LABORATORY FOR OPTICAL PHYSICS AND ENGINEERING TEAM — Quantum beating resulting from the coherent superposition of states in the Rb atom with pairs of femtosecond pulses has allowed for weak interaction between the 7S-5D<sub>5/2</sub> and 8S-6d<sub>5/2</sub> wavepackets to be examined. The dominant 7S-5D<sub>5/2</sub> beating was identified at 18.225 THz with an accuracy on par with NIST data and was demonstrated to persist in excess of 1 ns after excitation. A weaker beating of the 8s-6d<sub>5/2</sub> oscillation is measured at  $10.732 \pm 0.002$  THz (where the uncertainty represents the frequency resolution when no zero padding is used in the discrete Fourier transform), which is  $0.5 \text{ cm}^{-1}$ , or 10 times the frequency resolution, above that given by NIST data. This measured impact of the 7S-5D<sub>5/2</sub> wavepacket on the 8S-6d<sub>5/2</sub> superposition is consistent with the classical model of coupled oscillators.

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