Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Dependence of Ramsey fringe width on parameters JAMES SUPPLEE, Drew U. and Stevens Tech., PAUL-MICHAEL HUSEMAN, Drew U. — A Ramsey pulse pair (two coherent pulses separated in time) clearly has much longer duration than either pulse would have by itself. This gives the Ramsey pair a narrower energy spectrum than the single pulse and therefore a fundamental spectroscopic advantage in resolution. Even if one uses a single "long-type" pulse (duration equal to that of the entire Ramsey pair including dark time) instead, the Ramsey pair spectrum can still be narrower. Under a broad range of circumstances, the central peak of the Ramsey pair's spectrum is only about 0.6 times as broad as that of a single long-type pulse. This "narrowing factor" of 0.6 does not always carry over directly to a comparison of peak widths as measured by population inversion. We will present results of calculations that explore how this narrowing factor (Ramsey versus single long-type pulse) depends on parameters such as pulse duration, dark time, and atomic inversion.

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Date submitted: 02 Feb 2007 Electronic form version 1.4