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Manipulation of Raman Resonances Using Magnetic Fields[1]
SARA A. DESAVAGE, Aerospace Mass Properties Analysis, Inc., JON P. DAVIS, FRANK A. NARDUCCI, Naval Air Systems Command — We have theoretically and experimentally studied Raman resonances in multi-level atoms (specifically ^{85}Rb). Our emphasis has been on varying the relative orientation of the magnetic field with respect to the propagation direction of the Raman fields. We find that, in general, the spectrum consists of up to 11 peaks. By considering selection rules, we show that it is possible to orient the magnetic field so that either a 6 peak spectrum or 5 peak spectrum results, depending on whether the Raman fields contain a polarization component along the magnetic field direction or not. Furthermore, we find that the spectrum is not always symmetric with respect to the magnetically insensitive transition (clock transition). We explore the origins of the asymmetry and the overall shape of the spectra. We will discuss applications to magnetically sensitive atom interferometry.

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