

## Raman transitions between hyperfine clock states in a magnetic trap

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We present our experimental investigation of an optical Raman transition between the magnetic clock states of  $^{87}\text{Rb}$  in an atom chip magnetic trap. The transfer of atomic population is induced by a pair of diode lasers which couple the two clock states off-resonantly to an intermediate state manifold. This transition is subject to destructive interference of two excitation paths, which leads to a reduction of the effective two-photon Rabi-frequency. Furthermore, we find that the transition frequency is highly sensitive to the intensity ratio of the diode lasers. Our results are well described in terms of light shifts in the multi-level structure of  $^{87}\text{Rb}$ . The differential light shifts vanish at an optimal intensity ratio, which we observe as a narrowing of the transition linewidth. We also observe the temporal dynamics of the population transfer and find good agreement with a model based on the system's master equation and a Gaussian laser beam profile. Finally, we identify several sources of decoherence in our system, and discuss possible improvements.

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