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**Population transfer in Na s-p Rydberg ladder by chirped microwave pulse** H. MAEDA, J.H. GURIAN, T.F. GALLAGHER, Department of Physics, University of Virginia, Charlottesville, VA 22904, USA — Quantum defects of $ns$ and $np$ Rydberg states of Na are quite large, $\delta_s = 1.35$ and $\delta_p = 0.85$, respectively, while for $n\ell$ states with $\ell \geq 2$ values of $\delta_\ell$ are nearly zero. Therefore Na $ns$ and $np$ states are energetically isolated from the higher angular-momentum states in the same $n$ manifold. Together with the fact that energy spacing between $ns$ and $np$ states and $ns$ and $(n-1)p$ states are almost equal, i.e., $\Delta E_{ns-np} \approx \Delta E_{(n-1)p-ns} \approx 1/2n^3$ in a.u., we can think of Na $ns$ and $np$ Rydberg states as a specific example of simple ladder system consisted with only $s$ and $p$ angular momentum states. Here we demonstrate that population transfer in the Na $s$-$p$ Rydberg ladder can be effectively achieved using a frequency chirped microwave pulse, which dominantly couples only $s$ and $p$ states under a suitable condition. This work has been supported by the NSF.

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