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Effects of Degeneracy and Excited-State Spectral Overlap on Sub-Doppler Laser Cooling JOSH W. DUNN, CHRIS H. GREENE, Department of Physics and JILA, University of Colorado, Boulder, CO — Using the Monte Carlo wave-function technique, we perform fully quantum calculations of 3D laser cooling for atoms with nonzero nuclear spin. The calculations lead to predictions for the temperature of atoms cooled in both the σ_+-σ_- and the lin $\perp$ lin laser configurations. We explore the effect of increased cooling due to internal atomic degeneracy and decreased cooling due to spectral overlap of hyperfine excited states. The results of these competing effects are revealed for various fermionic alkaline-earth atoms and fermionic Yb.

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