Adiabatic Rapid Passage Forces for Laser Cooling\textsuperscript{1} JOHN ELGIN, HAROLD METCALF, Physics and Astronomy, Stony Brook University, 11794-3800 — Optical forces from Adiabatic Rapid Passage (ARP) have been shown to be significantly larger than the ordinary radiative force even outside the usual adiabatic parameter range of $\Omega_0 \sim \delta_0 \gg \omega_m \gg \gamma$. Here $\Omega_0$ is the peak Rabi frequency, $2\delta_0$ is the sweep range, $\omega_m$ is the repetition rate, and $\tau \equiv 1/\gamma$ is the excited state lifetime. For ARP to be useful for laser cooling it needs to be not only strong, but also dependent on atomic velocity $v$. We have shown preliminary $v$-dependent measurements with an apparatus having two independent counter-propagating chirped pulses. Having further improved our ability to measure and control the pulse shape and frequency chirp we present our newest $v$-dependent data and draw some comparisons between ARP and the bichromatic force.

\textsuperscript{1}Supported by ONR