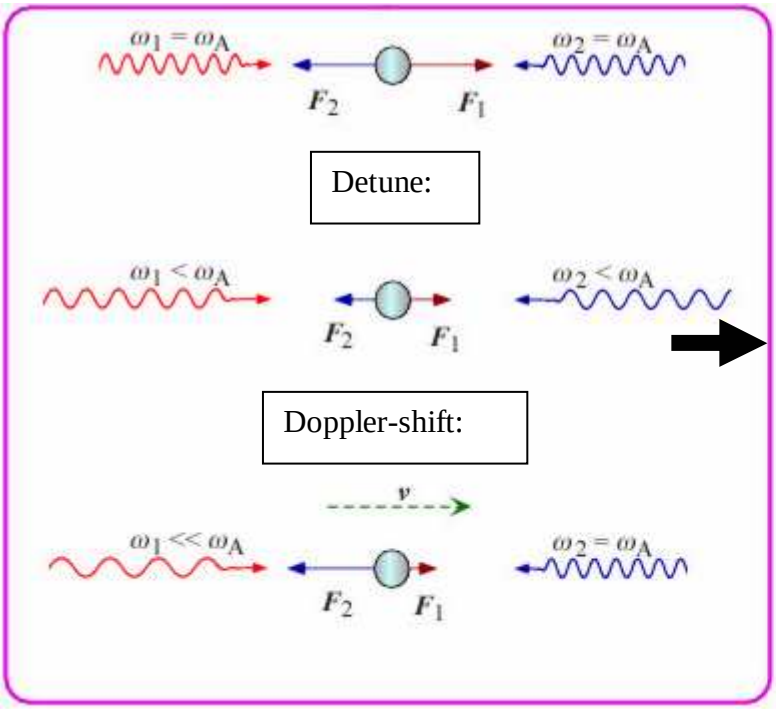
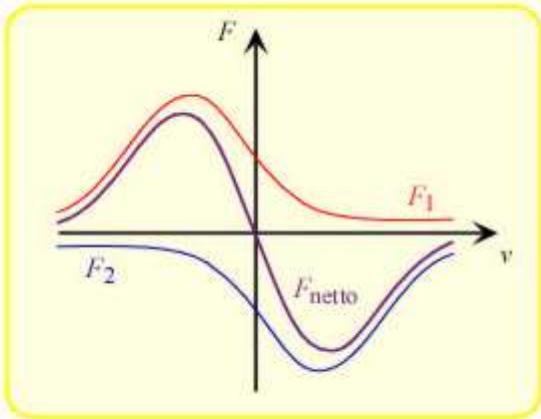
More Cooling:

Doppler-cooling is achieved by placing the atom in two counter directed monochromatic laser beams. The lasers are slightly detuned to the red. This means that the atom resonance is Doppler-shifted so that it reacts with photons coming from the beam the atom is travelling against.





The net-resulting force with respect to the atom-velocity v:

So, how much can one Doppler-cool an atom?
The limiting factor is heating caused by the increase in momentum spread, resulting in increased Brownian motion in the momentum space:

$$\langle p \rangle = 0 \text{ but } \langle p^2 \rangle \neq 0.$$

Equilibrium between cooling and heating is given by: $k_B T_D = h\Gamma/4\pi$ where T_D is the Doppler temperature, Γ is the line width. Note that this is independant of intensity, mass as well as frequency.
As lowest you reach about 240 μK with Na-atoms corresponding to the Doppler limit. Can you go even lower?