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Controlling hot electrons by wave amplification and decay in compressing plasma PAUL SCHMIT[1], ILYA DODIN, NATHANIEL FISCH, Princeton University — Through particle-in-cell simulations, it is demonstrated that a part of the mechanical energy of compressing plasma can be controllably transferred to hot electrons by preseeding the plasma with a Langmuir wave that is compressed together with the medium. Initially, a wave is undamped, so it is amplified under compression due to plasmon conservation. Later, as the phase velocity also changes under compression, Landau damping can be induced at a predetermined instant of time. Then the wave energy is transferred to hot electrons, shaping the particle distribution over a controllable velocity interval, which is wider than that in stationary plasma. For multiple excited modes, the transition between the adiabatic amplification and the damping occurs at different moments; thus, individual modes can deposit their energy independently, each at its own prescribed time.

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