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Controlling laser-ion acceleration with chirped pulses FELIX MACKENROTH, Max Planck Institute for the Physics of Complex Systems, ARKADY GONOSKOV, MATTIAS MARKLUND, Chalmers University of Technology — The recently proposed novel laser-ion acceleration scheme *Chirped-standing-wave acceleration* (CSWA) makes use of chirped high-intensity laser pulses to gain enhanced control over the accelerated ions' phase space distribution. The first proof-of-principle analysis of this scheme promised favorable scaling properties of ion energies and densities while simultaneously offering unprecedented spatial and temporal control over the ion beam itself. In this talk we provide an extended analysis of the schemes' further capabilities accessible through, e.g., customized laser chirps and targets. We provide quantitative estimates for existing and upcoming experimental facilities to highlight the scheme's versatility. Furthermore, we benchmark the newly proposed scheme against conventional laser-ion acceleration schemes. To this end we use the accelerated ions' flux as a measure for the conversion efficiency of laser energy into ion kinetic energy and provide a systematic comparison of the theoretically achievable performances of the most common laser-ion acceleration schemes. We find CSWA to be highly competitive in terms of reachable ion energies and fluxes.

Felix Mackenroth
Max Planck Institute for the Physics of Complex Systems

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