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TeV/m acceleration in laser-graphene interactions

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Electron acceleration in solid-state plasmas is of interest within the Laser Wakefield Acceleration (LWFA) research. Layered nanostructures such as graphene nanoribbons can be used as targets for intense UV lasers to generate and accelerate electron bunches. We present numerical Particle in Cell (PIC) simulations of a novel sub-femtosecond self-injection scheme which relies on edge-plasma oscillations in a layered graphene target. The scheme delivers 0.4 fs-long electron bunches of 2.5 pC total charge with an energy gain rate of 4.8 TeV/m. These parameters are unprecedented and, if confirmed experimentally, may have an impact on fundamental femtosecond research.

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Footnotes

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Yes

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