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Laser ion acceleration with a large-area suspended graphene target from sub-relativistic to relativistic intensities

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Laser ion acceleration has been investigated for medical applications and fundamental researches. It is known that the thinner targets generate higher energy ions, however, the thinner targets are easily broken by laser prepulses and pedestals before the main pulse arrivals [1]. We have developed a large-area suspended graphene (LSG) target for laser ion acceleration [2]. Graphene is the strongest and transparent two dimensional material made of an atomicaly thin carbon lattice [3, 4, 5]. We have conducted a series of experiments using LSG with various laser conditions from sub-relativisic to relativistic intensities and from femtosecond to picosecond pulse durations without plasma mirrors.

References

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