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Hybrid Graphene Based Material Promising Target in Laser Matter Interaction

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Graphene oxide foils implanted by copper ions at low energy and high dose, have been proposed as hybrid graphene based materials suitable to be laser irradiated in vacuum to produce hot plasmas. The special lattice structure of the graphene oxide foil can improve the propagation of the laser accelerated electrons inside the foil and enhance the electron density emerging from the rear foil surface. In such conditions increases the electric field developed in the non-equilibrium plasma and the consequent forward ion acceleration.
The foils have been optimized in thickness and they were irradiated with optimized laser parameters in order to produce high energy and quasi-monoenergetic proton beams by the femtosecond laser at the Institute of Plasma Physics and Laser Microfusion in Warsaw, Poland. Silicon carbide and ion collector detectors were used in time-of-flight configuration to monitor the plasma properties and to measure the velocity of the emitted protons and carbon ions from plasma.

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