

Fibre Laser Based Dielectric Gratings Accelerator

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Dielectric laser accelerators (DLA) have great potential for applications, since they can generate acceleration gradients in the range of GeV/m and produce attosecond electron bunches. We numerically investigated the optimum structure dimensions of a dual-gratings accelerator structure made of silicon, the standard material for photolithography fabrication process and compare the accelerating efficiency for the case of asymmetric and symmetric distribution of dielectric and vacuum space. We analytically estimated the laser requirements and propose a suitable power source. Finally, we proposed a new scheme for better beam confinement. The codes CST Microwave Studio and Particle Studio are used for simulations and benchmarked against the VORPAL code.

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