

Electron direct laser acceleration through a dilute magnetized plasma channel

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Abstract

In this paper we investigated longitudinal acceleration of a test electron using a Gaussian laser pulse through a dilute magnetized plasma channel. We have shown that parameters like amplitude and polarization angle of the laser pulse, density of plasma and the strength of magnetic field significantly influence the dynamics of electrons. We found that presence of magnetic field in the plasma channel increases the required density threshold for electron acceleration. Here, we examined the dependence of electron acceleration on various parameters in the magnetized plasma channel and compare it with non-magnetized case. According to numerical results for polarization angle $\theta = \pi/2$ the presence of magnetic field intensifies electron acceleration in the magnetized plasma channel.

Keywords: Electron acceleration, Ion channel, Magnetized plasma

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