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How can electrons be accelerated by a longitudinal wake field excited in a plasma?

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Abstract
The possibility of charged particle acceleration by a longitudinal wake field excited in plasma by an electron bunch and a train of electron bunches is investigated. The exact solution of the stationary nonlinear self-consistent interaction of a monoenergetic relativistic bunch with cold plasma is obtained. It is shown that under certain conditions a self-acceleration of the bunch tail electrons up to high energies is possible.

Footnotes

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