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Title

Dissipative solitons in carbon nanotubes

Source

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Abstract

The possibility of analogs of dissipative solitons occurring in arrays of carbon nanotubes under the action of a high-frequency external uniform electric field on the array has been established theoretically. The electromagnetic field has been considered in terms of the Maxwell equations, and the conduction electrons in carbon nanotubes have been described by the Boltzmann kinetic equation in the relaxation-time approximation. The external ac electric field serves for energy pumping of the electronic subsystem, whereas a finite relaxation time leads to energy dissipation. The generation of a periodic sequence of electromagnetic pulses has been revealed. This sequence can be used for producing terahertz frequencies. (28 References).