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# Synchrotron radiation of polarized electron beams in laser wake eld acceleration

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Ultrarelativistic electrons emit X-ray radiation, which can be used as a diagnostic tool in experiments with high-energy-density states of matter [1]. In this work an acceleration process of polarized electron beams [2] is analyzed in the wakeeld generated by a short high-intensity laser pulse in a preformed plasma channel. An initial density prole of plasma electrons in the channel is chosen to be parabolic and an envelope of the laser pulse is assumed to be Gaussian at the entrance of the channel. Considered subpicosecond intense laser pulse corresponds to the laser system PHELIX [3] and has a duration of 0.5 ps, wavelength of 1 m and total energy of 100 J. During the acceleration relativistic electrons undergo betatron oscillations and emit synchrotron radiation. This radiation is used for many applications [4], for example, for radiographic and spectral diagnostic setups, but can aects characteristics of the electron beam [5].
A model for numerical simulations of acceleration of polarized electrons emitting radiation is proposed in this work. This model takes into account the synchrotron radiation by adding a radiative reaction force in the Landau-Lifshitz form to equations of an electron motion. In the prescribed conditions, the critical energy of the emitted photons is estimated and their in
uence on the electron
trajectory and beam polarization dynamics is studied.

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