

Abstract Submitted
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Characteristics of the Betatron Radiation from the Direct-Laser Accelerated Electrons TAIWU HUANG, Peking Univ, ALEX ROBINSON, Central Laser Facility, CANGTAO ZHOU, BIN QIAO, BIN LIU, XIANTU HE, Peking Univ, PETER NORREYS, Central Laser Facility — The underlying scalings of the direct-laser accelerated electrons and the radiated photons are investigated. The dependence of the radiation properties on the plasma density and laser intensity is given analytically. It is shown that the electron dynamics and the emitted photons are strongly dependent on a self-similar parameter of $n_e/n_c a_0$. This controls the energy gain and the transverse betatron amplitude of the electrons, as well as the radiated photon number and photon energy. In addition, the total number of the photons is proportional to a_0^2 and the conversion efficiency of the photons from the accelerated electrons is proportional to a_0^3 for a fixed value of $n_e/n_c a_0$.

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