

Analytic solutions of Dirac equation for relativistic magnetized plasma in strong field quantum electrodynamics regime

B.S.Sharma

*Department of Physics,
Lords University, Alwar-301001,
India**

In this paper we study analytical solution of Dirac equation in the background of electromagnetic fields of an ultra-intense laser of intensity $10^{24}W/cm^2$, non-laser photons radiated by the accelerated electrons in strong field quantum electrodynamics regime, and electrostatic waves in the magnetized plasma. The effect of renormalized mass of electron and non-zero effective mass of accelerated photons has been taken into consideration. The wave function solution exhibits differences from the earlier works for present available intensity $10^{24}W/cm^2$. An attempt has been made to obtain the conserved quantities of the problem and electron effective mass.

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* bssharma@lordsuni.edu.in