

High Harmonic Generation and QED Effects Induced by Relativistic Oscillating Mirror

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Intensities of the forthcoming laser facilities are approaching 10^{23-24} W/cm². With such a high intensity, the laser-plasma interactions are dominated by the QED regime. In this work, we present the high brightness γ -photon emission and e^+e^- pair creation accompanied with the high harmonic generation. Relativistic oscillating mirror reflects the incident intense laser field and generates the focused attosecond pulse with intensity enhancement. A large number of high energy photons are emitted by the radiation trapped electron colliding with the high harmonic pulse. The corresponding photons are counter-propagating through the strong laser field which provide a high probability for pair creation. Relativistic positron bunches are obtained and further accelerated in the reflected laser field. This regime may be beneficial for the potential experiments carried on the large laser facilities such as ELI-beamlines¹.

References

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