

References

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P14.

Plasma effects in attosecond pulse generation from ultra-relativistic laser-plasma interactions

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Particle-in-cell simulations were performed to examine the influence of plasma effects on high harmonic spectra from the interaction of ultra-intense *p*-polarized laser pulses with overdense plasma targets. Furthermore, a theoretical model is proposed to explain the radiation mechanism that leads to attosecond pulse generation in the reflected field.

It is shown that plasma harmonic emission affects the spectral characteristics, causing deviations in the harmonic power decay as compared with the so-called universal 8/3-decay. These deviations may occur, in a varying degree, as a consequence of the extent to which the plasma line and its harmonics affect the emission. It is also found a strong correlation of the emitted attosecond pulses with electron density structures within the plasma, responsible to generate intense localised electrostatic fields. A theoretical model based on the excitation of Langmuir waves by the re-entrant Brunel electron beams in the plasma and their electromagnetic interaction with the laser field is proposed to explain the flatter power spectral emission -described by a weaker 5/3 index and observed in numerical simulations- than that of the universal decay.

P15.

Development of the RTP crystal applications for Q-switching operation & Second Harmonics Generation

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A dialed theoretical studies on performances of the ideal RTP crystal for the electro optical application as Q-switching laser operation and for nonlinear optics application as second harmonics generation are accomplished in this paper.

Single or pair RTP crystal of excellent quality with dimensions 5×5×7.5 mm³ have proposed as element model to combined Q-switching operation and frequency doublers for 1.06 μm wave length laser.

In order to get and interpolate the optimum conditions to combined both of these operations by application this RTP model, The main aim of this work was investigated the most influent parameters on the performance of the electro optical Q-switching laser operation such as, the voltage requirement, contrast and extinction ratios, the birefringence effective and withstand threshold . on the other hand the influences of the ray walk off, thermal effective on the efficiency of the second harmonics generation as well are investigated. The results were satisfied for the goals of this paper.