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Plasma dynamics characterization for improvement of high-order harmonics generation in laser-produced plasmas NAVEED ABBASI, GANJABOY BOLTAEV, RASHID GANEEV, VYACHESLAV KIM, MAZHAR IQBAL, ALI ALNASER, American University of Sharjah — High-order harmonic generation (HHG) of ultrashort laser pulses in laser-produced plasmas (LPPs) requires the optimally formed plasma plumes during laser ablation of different targets. Plasma dynamics characterization for improvement of HHG in LPPs allows determining the best conditions of laser-plasma interaction. We analyze the temporal dynamics of the plasma characteristics suitable for HHG using ICCD camera and delay-dependent variations of the yield of harmonics in the case of application of low- (C), medium (Ti), and heavy-weight (Au) atoms. Role of the nanoparticles appearing during laser ablation on the HHG efficiency is discussed. We present the time-resolved spectra and images of C, Ti, and Au plasmas. The velocities of the LPPs produced on different targets are determined and compared with those defined from the HHG studies at optimal delays between the heating and driving pulses.

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