

Abstract Submitted  
for the TSF15 Meeting of  
The American Physical Society

**Generation of enhanced even and odd harmonics in a two-color laser field**<sup>1</sup> M. SAYRAC, A. A. KOLOMENSKII, Y. BORAN, Texas AM University, J. STROHABER, Florida AM University, H. A. SCHUESSLER, Texas AM University — We present results on an enhanced production of high harmonics (HHs) with a two-color laser field ( $\omega_0 + 2\omega_0$ ) in argon (Ar), nitrogen (N<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) gases having close ionization potentials,  $I_p = 15.6\text{eV}$ ,  $I_p = 15.7\text{eV}$ , and  $I_p = 13.77\text{eV}$  respectively. The fundamental radiation at  $\omega_0$  corresponds to 50fs pulses from a Ti:sapphire chirped-pulse amplifier laser system at 800nm. Odd  $(2n + 1)\omega_0$  ( $n = 2 - 10$ ) and even  $2(2m + 1)\omega_0$  ( $m = 1 - 3$ ) harmonics, were observed in the  $\omega_0 + 2\omega_0$  driving field. High harmonics were measured for parallel and perpendicular relative polarizations orientations of the  $\omega_0$  and  $2\omega_0$ -fields, and intensity of  $\omega_0$  beam was  $\sim 1.5 \times 10^{14}\text{W/cm}^2$ , and  $2\omega_0$  beam was in the range  $\sim 3 \times 10^{12} - 3 \times 10^{13}\text{W/cm}^2$ . An increased conversion efficiency into HHs, notably of the  $2(2n + 1)$  orders was found for the latter case. With the combined  $(\omega_0 + 2\omega_0)$  field, which was obtained by inserting a doubling crystal into the fundamental ( $\omega_0$ ) beam, more than an order of magnitude enhancement of the HHs signal was observed compared to the  $\omega_0$ -field or its second harmonic ( $2\omega_0$ ) alone. We also discuss similarities and differences of the HH generation in the three gas media with a single and two-color beams.

<sup>1</sup>This work was supported by the Robert A. Welch Foundation Grant No. A1546, the Qatar Foundation under the grant NPRP 5-994-1-172, and the Ministry of National Education of the Republic of Turkey.

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Date submitted: 09 Oct 2015

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