Electron-Positron Pair Creation in the Presence of Two High Intensity EM Beams with Different Photon Energies

I Ploumistakis[1], S D Moustaizis[1], and I Tsohantjis[2]

[1] *Laboratory of Matter Structure and Laser Physics, Technical University of Crete, Polytechnical Campus, Chania, Greece. Contact Phone: +306937750997*

[2] *Department of Nuclear and Particle Physics, National and Kapodistrian University of Athens, Faculty of Physics, Athens, Greece*

Contact Email: jploumis@gmail.com

Our aim is to investigate the efficiency of e+ e- pair creation using a scheme of two interacting EM beams of different photon energies w1, w2 each, based on the theoretical treatment of Lyul'ka [1].

The present work is motivated by the utilization of similar schemes which have been proposed for photon beam interaction in the extreme photon energy (gamma-gamma or gamma-X-ray beam interaction) [2-5].

Finally, we will present the efficiency of pair creation for various photon energy values w1, w2, and we are going to compare the efficiency of our proposed scheme to those examined in our previous work [6], which is based on Popov's theoretical model [7].

References

[1] V A Lyul'ka, J. Exp. Theor. Phys. **40**, 815 (1975)

[2] X Ribeyre, E d'Humières, O Jansen, S Jequier, V T Tikhonchuk and M Lobet, Phys. Rev. E **93**, 013201 (2016)

[3] X Ribeyre, E d'Humières, O Jansen, S Jequier and V T Tikhonchuk, Plasma Phys. Control. Fusion **59**, 014024 (2017)

[4] I Drebot, D Micieli, E Milotti, V Petrillo, E Tassi and L Serafini, Phys. Rev. Accel. Beams **20**, 043402 (2017)

[5] M Lobet, X Davoine, E d'Humières and L Gremillet, Phys. Rev. Accel. Beams **20**, 043401 (2017)

[6] I Ploumistakis, S D Moustaizis and I Tsohantjis, High Power Laser Sci. Eng. **4**, E41 (2016)

[7] V S Popov, Sov. J. Nucl. Phys. **19**, 584 (1974)