

Pulse Envelope Interference Effects in the Nonlinear Compton and Breit-Wheeler Processes

B KING¹ AND S TANG²

¹*Center for Mathematical Sciences, University of Plymouth, Plymouth, UK*

²*Department of Physics, Ocean University of China, Qingdao, China*

Contact Email: b.king@plymouth.ac.uk

The locally constant field approximation takes into account interference on a sub-wavelength scale, and the locally monochromatic approximation takes into account interference on the scale of the laser wavelength. The purpose of this work is to identify what is being missed in these approximations due to interference on the length scale of the *pulse envelope*. By calculating tree-level processes in a background potential that is the product of a monochromatic field and a flat-top envelope, we find that the finite bandwidth of this background allows for the activation of harmonic orders that are otherwise forbidden in local approaches. We will present the spectral features and polarisation effects in both the Compton and Breit-Wheeler processes that arise due to these extra channels.