

Tunneling Phenomena in Nonlinear Compton Scattering: Q-Deformed Photon Tails, Rise and Fall of Laser Intensity Effects in Spectrally Resolved Cross Section, Seeding of Pair Production

B KÄMPFER¹, A I TITOV², AND U HERNANDEZ ACOSTA¹

¹*Inst. Rad. Phys., Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

²*Bogolubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Russia*

Contact Email: b.kaempfer@hzdr.de

Analog to the nonlinear Breit-Wheeler pair production (nlBWpp)[1], the nonlinear one-photon Compton scattering exhibits similar tunneling phenomena which manifest themselves in exponential dependencies on invariant laser intensity parameter and quantum nonlinearity parameter [2,3]. The high-energy photon tails display q-deformed exponential spectra depending on the laser polarization [4]. Spectrally resolved differential cross sections rise with increasing laser intensity, reach a maximum at medium intensity, and fall towards the high-intensity regime [5]. The hard Compton photons seed nlBWpp with remarkable sensitivities on primary energy and laser intensity. The considered parameters of the latter quantities are motivated by opportunities at LUXE and analog future installations, see [3].

References

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