Radiation Reaction Effects in Cascade Scattering of Intense, Tightly Focused Laser Pulses by Relativistic Electrons. Classical approach.

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I have made the calculation of electron motion in a strong counter-propagating laser pulse including the radiation damping and spectral analysis of electron radiation in the classical approach using 6-orde Runge-Kutta method. A booster scheme is proposed to overcome the radiation friction.

Computers	SX8
Run	600 hours
Memory	30 GB

Fig.4

Spectra of backward scattering ($\theta=\pi$) in the two pulse scheme ; both pulses have a_0=100, τ=10 fs the scattered pulse is focused in w_0=5 μm, the driving pulse is a plane wave.

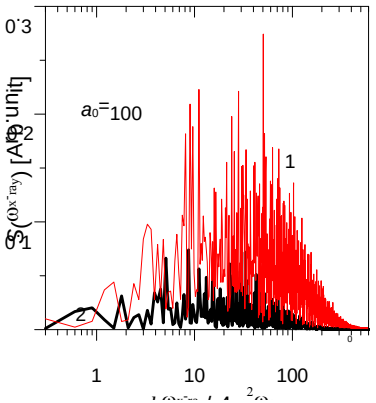
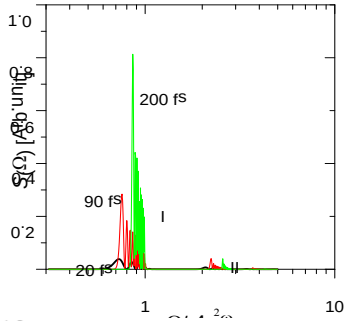
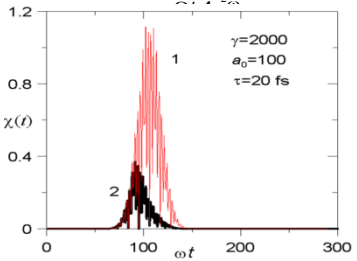


Fig.1



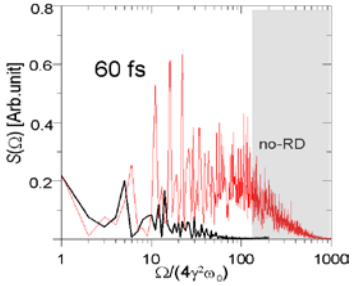
Spectra of backward scattering at a_0=1 for Gaussian pulses 20, 90, and 200 fs; head-on collision at γ=200. (I) are the fundamental harmonics, (II)- the third harmonics. Radiation damping is included.

Fig.2



Time evolution of the quantum parameter for an electron γ=2000 with and without the radiation damping in a 20 fs Gaussian pulse with a_0=100; head-on collision.

Fig.3



Spectra of backward scattering with a_0=200 Gaussian pulses of 60 fs for a head-on collision, γ=700,