

Spatio-temporal coupling under tight focusing an ultrashort laser pulse by an off-axis parabolic mirror

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We propose a model in the form of Stratton-Chu integrals to describe ultrashort tightly focused laser pulses. Based on it, we analyze the formation of spatio-temporal coupling and the impact of an off-axis angle of the focusing mirror on the laser pulse dynamics. We show that in the case of the factorizability of the spatial-temporal profile of an incident laser pulse, the computational complexity of the model is equal to one of the monochromatic approximation. The model quality is checked in PIC-simulations by the comparison of results obtained by different approaches.

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