Taming Intense Ultrashort Laser and THz Wave Packets

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The nonlinear propagation of ultrashort laser pulses in the form of solitons, filaments and light bullets is an exciting research field. Beyond the basic studies on the complex physical phenomena involved, the field is driven significantly by the numerous applications. One major application is the use of filaments as sources of intense THz radiation [1]. The strength of these sources is such that opens the way to perform excitation and nonlinear optics experiments in this part of the spectrum (see e.g. [2]).

In this presentation I'll be discussing a number of studies we have been performing on taming these strong laser and THz fields based on two major approaches: using exotic wave packets (see e.g. [3-4]) and photonic lattices (see e.g. [5]).