

24th February, 2014 - 11:00 a.m.

CUI seminar in bldg. 99, seminar room IV (O1.111)

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Generation and applications of nonlinear-dispersive similaritons in fibers

Similaritons, pulses with the distinctive property of self-similar propagation, are attractive due to their fundamental interest and prospective applications in ultrafast optics and photonics. The signal analysis and synthesis problems on the femtosecond time scale demand the generation of broadband similaritons. Applications of broadband nonlinear-dispersive similaritons (of up to 75-THz FWHM bandwidth)

generated in passive single-mode fibers for pulse temporal and spectral compression, frequency tuning, femtosecond signal characterization by spectrotemporal imaging and spectral interferometry, and CARS spectroscopy will be presented, based on our experimental and numerical studies and supported by the concept of similariton-induced temporal lens.

In the figure: spectrum of broadband nonlinear-dispersive similariton (left), and 3D frequency tuning patterns with spectral compression (sharp peaks) and without it (thick lines) for the similariton chirp measurement (right).

