

Photonic bandgap fibers with resonant structures for tailoring the dispersion

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Abstract: Numerical simulations on different kinds of realistic photonic bandgap fibers exhibiting reversed dispersion slope for the propagating fundamental mode are reported. We show that reversed or flat dispersion functions in a wide wavelength range using hollow-core, air-silica photonic bandgap fibers and solid core Bragg fibers with step-index profile can be obtained by introducing resonant structures in the fiber cladding. We evaluate the dispersion and confinement loss profiles of these fibers from the Helmholtz eigenvalue equation and the calculated fiber properties are used to investigate the propagation of chirped femtosecond pulses through serially connected hollow core fiber compressors.

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