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**Average speeds and durations of pulsed plane waves transmitted through chiral sculptured thin films** JOSEPH GEDDES, AKHLESH LAKHTAKIA, Penn State University — We computed, with a finite-difference algorithm, the durations and average speeds of pulsed, ultrashort, optical plane waves transmitted through chiral sculptured thin films (STFs). Chiral STFs are assemblages of parallel nanohelixes affixed to a substrate; the helixes possess diameters of 10–300 nm, lengths of micrometers, and pitches that can be engineered during the fabrication via physical vapor deposition. We modeled the chiral STFs as continuously nonhomogeneous, anisotropic dielectric materials which are either linear or exhibit a Kerr-type nonlinearity. We computed the equivalent, root mean square, and correlation durations of the transmitted pulses and found that these quantities tend to increase with decreasing carrier wavelength, though there is an exception to this trend when the linear film exhibits the circular Bragg phenomenon. Increasing nonlinearity also tends to increase the durations of transmitted pulses. We computed the average peak speed, center-of-energy speed, and correlation speed of the pulsed plane wave and found that these speeds tend overall to increase with carrier wavelength but decrease with increased nonlinearity. Our results will have application in the design of optical pulse shaping devices.

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