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Title:Design of an ultra-broadband all-optical fractional differentiator with a long-period fiber grating
Authors:Cuadrado-Laborde, Christian (1); Andrés, Miguel V. (2)
Author affiliation:(1) CONICET, P.O. Box 3, Gonnet 1897, La Plata, Buenos Aires, Argentina; (2) Departamento de Fisica Aplicada y Electromagnetismo, ICMUV, Universidad de Valencia, C/Dr. Moliner 50, Burjassot, Valencia 46100, Spain
Corresponding author:Cuadrado-Laborde, C.(Christian.Cuadrado@uv.es)
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Abstract:We propose an all-optical in-fiber ultra-broadband fractional differentiator. We numerically demonstrate that a long-period grating inherently performs the temporal fractional differentiation on an optical pulse propagating in the fundamental fiber mode, within a certain spectral bandwidth around the resonance frequency. The device shows a good accuracy calculating the fractional time derivatives of the complex field of THz-bandwidth optical pulses. © 2011 Springer Science+Business Media, LLC.