

Abstract

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Relectivity of Nonlinear Apodized Chirped Fiber Bragg Grating Under Water

The nonlinear behavior of the chirped apodized fiber Bragg grating (FBG) is studied and investigated by solving the nonlinear coupled mode equations for the forward and backward signals using the fourth order Runge-Kutta method. The electric field of these signals in the chirped Bragg grating is first calculated from which, the new values of the refractive index are determined. The nonlinear effects appear on the reflectivity and the transmittivity of traveling signals. A full study for the performance of the nine apodization profiles for the FBG under the effect of temperature, pressure and water depth are investigated. Then, schedules have been done for the optimum values for the reflectivity of all types, Selecting the appropriate profile which is the Sinc one giving about 99% reflectivity for the grating.