

Abstract

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Distributed Feedback Fiber Filter Based on Apodized Fiber Bragg Grating

This paper explores the potential of using Distributed Feedback Fiber (DFB-F) under lasing threshold as a C-band optical filter. This is done with the aid of an apodized fiber Bragg grating (FBG) using different apodization profiles. Design optimization is carried out to mainly target Ultra Dense Wavelength Division Multiplexing (UDWDM) filtering specifications. The raised cosine profile DFB-F with grating length ($L = 30$ mm) and modulation depth ($m = 10^{-5}$) is chosen as the most suitable filter for UDWDM filtering specifications. This choice provides a Full Width at Half Maximum (FWHM) of 0.044 nm, no sidelobes and a peak reflectivity of 1.29. Compared to the famous apodized FBG based optical filter, this design gives a remarkable performance combined with compactness and easier fabrication.