Abstract

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Efficient Apodized-TFBG for DWDM Systems

This study is carried out to optimize the tilted fiber Bragg grating (TFBG) performance in the reflection mode. This optimization starts by controlling the tilt angle, that causes an intensive decrease in the full width at half maximum (FWHM) at the expense on the peak reflectivity. Grating tilt angle is compromised at 5° where a mutual point between narrower FWHM and unity peak reflectivity is achieved successfully. Then, different apodization profiles are applied with TFBG that yield a better performance concerning sidelobes. In general, the TFBG shows a better reflection spectrum when compared to regular FBG. The Nuttall apodization achieves the best performance. Asymptotic decay of 17 dB/nm, low main sidelobe strength (MSLS) of -206 dB, and a narrow FWHM around 0.16 nm were achieved.