

论文

倾斜光纤光栅谱特性

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摘要:

基于倾斜光纤光栅耦合模理论,采用数值分析法研究了前后向导模耦合时倾斜角度和调制深度对倾斜光纤光栅反射谱的影响,以及导模和辐射模耦合时针对不同的入射光偏振态在倾斜角度、调制深度、光栅长度等不同时倾斜光纤光栅透射谱(或反射谱)的特性.研究结果表明,在前后向导模耦合时,不同偏振态入射光的光谱几乎相同;而对于辐射模耦合,由于反射谱的包络受消光系数的调制,而不同偏振态入射光的消光系数不同,并且倾斜角度越大不同偏振态的入射光的消光系数差别越大,故在研究辐射模耦合时需要将偏振态予以考虑.

关键词: 倾斜光纤光栅 Bragg散射 辐射模 偏振

Spectrum Characteristics Analysis of the Tilted Fiber Bragg Grating

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Abstract:

Based on the mode coupling theory of the titled fiber Bragg grating with the numerical analysis methods, the tilted angle and modulation index on the effect of tilted fiber grating reflectivity spectra of front-back core mode coupling and characteristics of tilted fiber grating reflectivity and transmission spectra for core mode and radiation mode coupling on the condition of different tilted angle, index modulation and grating lengths for different polarization are discussed. The results of the study show that different incident lights with different polarizations are exactly the same for front and back core mode couplings. Incident light of s polarization and p polarization state should be taken into account for the radiation mode coupling, because reflectivity spectra envelope are affected by modulation of extinction coefficient and incident light with different polarizations have different extinction coefficients. Moreover, the greater tilted angle is, the more differences for the extinction coefficient of the incident light with difference polarization is.

Keywords: Tilted Fiber Bragg Grating(TFBG) Bragg scattering Radiation Polarization

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