

## **Asymmetric mode coupling in arc-induced long-period fiber gratings**

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### **Abstract.**

An extensive experimental study of the transverse modal field characteristics of microbend arc-induced long-period fiber gratings is presented. A wavelength scanning of the near-field intensity pattern inside each loss band in the transmission spectrum, shows a clear asymmetry in the transverse intensity distribution resulting from the fabrication method. This asymmetry reflects as a 10.7 dB difference in the notch depths for two orthogonal polarizations. Though a one year study, it was found that that environmental conditions during fabrication strongly affects the gratings characteristics. The best performance was obtained during the autumn season, where microbend arc-induced long-period fiber gratings produce wavelength filters with short lengths (between 10 and 30 periods for depths in excess of 20 dB) and the insertion loss may be as low as 0.12 dB.

### Keywords

Long-period fiber grating; Arc-induced; Modal pattern; Polarization state