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Conference Digest
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Ultra-low Bending Loss of 0.007 dB/loop for 10 mm of Bending Diameter at 1550 nm in the Double Trenched Bend Insensitive Optical Fiber

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The increase in the usage of FTTH in the optical communication has drawn much attention among the fiber optics engineers to face the challenges of sharp bends that are unavoidable at city apartment corners [1-2]. In the current communication, we report experimental demonstration of the ultra-low bending loss in the single mode optical fiber. The optical fiber was fabricated using the modified chemical vapor deposition (MCVD) process. The optical fiber’s core was surrounded by five cladding layers, innermost being the silica cladding followed by the first low-index trench, then the second silica cladding, the second low-index trench, and finally the third silica cladding. The double trenched bend insensitive optical fiber had the LP11 cutoff wavelength at 1190 nm. Its mode field diameter was determined using the lateral splice loss measurement technique and it was found to be about 8.5-9.5 μm at 1550 nm.

Measured bending losses at 10 mm and 5 mm of bending diameters are shown in Fig. 1. The bending loss was found to be in the range of 0.004 to 0.016 dB/loop for the entire band of 1200 nm to 1650 nm for 10 mm of bending diameter. Even at the bending diameter of 5 mm, which is quite low, the bending loss was measured to be about 0.42 dB/loop at 1550 nm.

Fig. 1 The spectral variation of the bending loss measured at different bending diameters. Bending loss is negligible for 10 mm of bending diameter and it is quite small for even 5 mm of bending diameter as compared to the existing bend insensitive fibers.

Such a low bending loss coupled with the property of broadband bend-insensitivity in the optical fiber should find future applications in the wide band FTTH handling multiple wavelengths.

References