similar to that reported for a high-temperature sensor using this same TCF [18]. Although the temperature sensitivity is not very high, in order to obtain accurate curvature measurements temperature effects has to be taken into account.

4. Conclusion

In summary, a novel, simple, and cost-effective curvature sensor based on a TCF has been demonstrated. The key advantages of the sensor are related to the simple splicing of the TCF and SMF, alignment of the off-axis core is not strictly required for optimum operation, and the sensitivity is significantly enhanced as compared to other fiber based curvature sensors. The mean error between the theoretical analysis and experimental data was less than 1%, which confirms the reliability of the theoretical model. The sensor exhibits linear response in the range from 0 to 0.2653 m^{-1}, with a sensitivity of −137.8763 nm/m^{-1}. Compared to grating-based and specialty fibers curvature sensors reported in the literature, the sensor exhibits a sensitivity 9.8 and 10.9 times higher, respectively. While most of the grating-based curvature sensors reported in literature are not capable of measuring small curvatures, the demonstrated sensor exhibits very high sensitivity in making such measurements, making it suitable for high-performance curvature measurements.

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