















Fig. 6. Numerical simulation of (a) the MZI-1 structure with a peanut-like section and an abrupt taper; (b) the MZI-2 structure with two collapsed regions rather than a peanut-like section and an abrupt taper.

### 3. Conclusion

In summary, we have experimentally demonstrated a compact and highly sensitive MZI for curvature sensing, the length of which is less than 3 mm. And it only requires simple fabrication including splicing. The unique MZI based a PCF exhibits a high curvature sensitivity of  $50.5 \text{ nm/m}^{-1}$  and a temperature sensitivity of  $11.7 \text{ pm}/^\circ\text{C}$ . The low temperature cross-sensitivity can find lots of application in the field of curvature sensing.

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