Abstract

Moustafa Hussein Aly

Few-mode ring core fiber characteristics: temperature impact

In this paper, a novel fiber is proposed to support few linearly polarized (LP) modes, with the feature of a circular ring-shaped core filled by liquid. This fiber supports four LP modes: LP01, LP02, LP31 and LP11. The properties of all spatial modes are numerically analyzed by considering the different optical parameters such as confinement loss, dispersion and differential modal delay (DMD) at different temperatures. The obtained results show that the proposed fiber reduces the confinement loss as well as DMD over the entire range of the C-band. The same characteristics are also investigated and optimized at 1.55 ?m in the temperature range 20–80 °C. Both confinement loss and DMD evidently decrease with temperature leading to the possibility of using this type of fibers as temperature sensors.