

Design and simulation of tapered optical fiber by enhancing the evanescent field region for sensing application

ABSTRACT

We report the design and simulation of the tapered optical fiber with large presence of the evanescent field. The evanescent field of the optical fiber is strongly affected by the surrounding environment which will be exploited into fabricating variety of photonic-based devices such as photodetectors, optical sensors and ultra-high Q resonators. The simulation results show that by adiabatically tapered the waist region, there is a fairly large amount of evanescent field intensity observed at the air-cladding region. The smooth transition region of the tapered fiber has also minimized the multimode interference in the waist and transition region thus reducing the energy loss and contributing to the higher output power.

Keyword: Tapered fiber; Evanescent field; Mode profile; Sensor