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| **Contact Email(s):** | drnasir@aiub.edu | | | |
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| **Abstract:** |  |
| For global broadband networks, fiber optic systems are vital components of the telecommunications infrastructure. Signal transmission with a broad bandwidth and minimal delay is a fundamental need for modern applications. Owing to its low transmission losses, the adoption of optical fiber is growing exponentially. Researchers are exerting significant effort to improve the transmission efficiency of fibers with extremely low loss. A suspended porous core Cyclic Olefin Copolymer (COC) based fiber model is proposed in this work. It is exceptionally transparent and crystalline plastic. This model is challenging to build a waveguide with a low loss for THz wave propagation since most polymers are particularly absorbent. The proposed fiber model also has an optimized core diameter. In this analysis, a fiber with a low EML of 0.039456 cm-1, a marginal due to confinement loss is 2.264 × 10-5 dBcm-1, low dispersion of 0.8594 psTHcm-1 and V-parameter is 1.142 for 300 core diameter and at 1 THz working frequency. Additional important propagation properties, such as the power fraction of the proposed fiber have also been thoroughly investigated. | |