|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Title:** | Anika Tun Naziba, Manika Tun Nafisa and Mohammad Nasir Uddin | | | |
| **Author(s) Name:** | Cyclic Olefin Copolymer Based Photonic Crystal Fiber as Single Mode THz Waveguide | | | |
| **Contact Email(s):** | drnasir@aiub.edu | | | |
| **Published Journal Name:** | **International Journal of Computing and Digital Systems** | | | |
| **Type of Publication:** | Journal | | | |
| **Volume:** | 15 | | Issue | 1 |
| **Publisher:** | UOB | | | |
| **Publication Date:** | Jan 2023 | | | |
| **ISSN:** | | e-ISSN 2210-142X | | |
| **DOI:** | 10.12785/ijcds/150121 | | | |
| **URL:** | http://dx.doi.org/10.12785/ijcds/150121 | | | |
| **Other Related Info.:** | Page 271-278 | | | |
|  | | | | |

|  |  |
| --- | --- |
| **Abstract:** |  |
| Photonic Crystal Fiber Technology (PCF) based terahertz (THz) communication is widely considered the key component of future generation high capacity communication and biomedical engineering. The most difficult aspect of employing this technology is minimizing material losses and dispersion over longer distances. In PCF modeling, a wide variety of materials are considered (Zeonex, Silica, Cyclic Olefin Copolymer, etc.). The Cyclic Olefin Copolymer (COC) stands out as a highly flexible material that is both easily fabricable and inexpensive. This study proposed hexagonal porous cladding and core using the Finite Element Method (FEM). A fiber with an optimal core diameter of 300 µm, a low Effective Material Loss (EML) of 0.039456 cm-1, a low Confinement Loss (CL) of 2.264 × 10-5 dBcm-1, dispersion of 0.8594 psTHz-1cm-1 and V-parameter of 1.42 are obtained for 1 THz operating frequency. The suggested fiber’s propagation parameters have been diligently analyzed and obtained promising values. A significant porosity of 65% and power fraction of 29.88% was recorded. | |