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Tapered Fiber Connector and its performance analysis

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The diameter of single mode fiber is approximately $50\ \mu\text{m}$, due to the small diameter of fiber, effective coupling between two optical fibers is possible when fiber connectors will have high precision. In this simulation work, effectiveness of fiber connector will be analysed based on core diameter, taper length, tapered ratio, and numerical aperture. Generally, optical fiber is used in pair for transmitting and receiving the optical signal. So, new type of directional tapered fiber connector would be designed in which the structure of the fiber head will be tapered as per the direction of signal transmission and market demand. For the performance analysis of new connector based on lateral deviation and other traditional connectors, coupling efficiency will be compared, it is observed tapered connector will have high efficiency at lower error rate based on optical transmission theory, numerical aperture matching technology, refractive index discontinuities, optical loss mechanism, longitudinal and angular deviation, materials etc.

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