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Polymer and Tapered Silica Fiber Connection for Polymer Fiber Sensor Application

Guest Editor:

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Message from the Guest Editor

Dear Colleagues,

The unique physical and chemical properties of polymer optical fibers (POFs) have attracted interest for use in the production of high-performance sensors over the past few decades. There are hundreds of applications where POF technology is used, such as in structural health monitoring, sensors for biochemical analyses, civil aircraft, and healthcare and biomedicine fields. One of the most important practical challenges in using POFs as sensors, mostly due to the high attenuation of POFs, is to connect polymer fibers with silica fibers or devices. One of the successful solutions for coupling light with high efficiency, is to glue POFs with silica fiber into a ferrule. However, this approach is unsuitable for microstructured polymer fibers (mPOFs), where glue gets into the the cladding holes, changing the properties of the guiding light. A possible solution, in this case, can be tapered silica fiber/fibers, inserted into one or more cladding holes of mPOFs. Moreover, such connections of polymer and silica fibers open new possibilities; for example, for displacement sensors.



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