

INTEGRATED OPTICAL WAVEGUIDE STRUCTURES FOR LOC APPLICATIONS

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Integrated optical devices have already been established for application in optical communication systems and optical sensing field. At present, however, they are mostly fabricated using essentially planar fabrication approaches like electron-beam lithography, UV lithography or focused Ion beam (FIB) etching. Three-dimensional 3D printing technology based on two photon polymerization (TPP) satisfy requirements on complexity, precision and possibility to prepare complex 3D structures with complicated details. It provides a number of advantages for additive manufacturing of polymer parts with dimensions ranging from a few microns up to the millimeter scale.

The aim of the research is to design and prepare waveguide structures based on IP dip polymer, such as Mach-Zehnder interferometers and ring resonators. We try to achieve a waveguide cross section under $1 \mu\text{m}^2$. Then to prepare a complex self-supporting structure with the option of fastening to the fiber tip for optical sensing in LOC applications.

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