

Multi-wavelength switching of an erbium-doped fiber ring laser based on the cross-sensitivities' features of tapered fiber filters

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Abstract.

In this work, multi-wavelength switching of laser emission of an erbium-doped fiber ring laser (EDFRL) is reported, by exploiting the cross-sensitivities' features (curvature and surrounding RI) of concatenated tapered fibers that form an interferometer. The curvature applied in the fiber interferometer switches the multi-wavelength laser emission in the range $\sim 1544.66\text{--}1565.72$ nm. The combination of curvature and substances with different refractive index (RI) allows switching the multi-wavelength emission to shorter wavelengths, in the range $\sim 1530.62\text{--}1565$ nm. In this proposal, the use of the cross-sensitivities' features extends the multi-wavelength emission in the operating C-band.

Keywords

Erbium-doped fiber Fiber taper Mach-Zehnder interferometer Multi-wavelength switching