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Narrow bandwidth optimization using a polymer microring resonator in a thulium–holmium fiber laser cavity (Article)

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Abstract

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A thulium–holmium fiber (THDF) laser cavity has been demonstrated with a SU-8 polymer microring resonator (PMRR) in the cavity. The PMRR has a 500μm radius and fabricated using the lithography method, with the SU-8 polymer acting as a host material. The butt coupling method was used for the horizontal coupling of light from a ultra-high numerical aperture (UHNA) fiber to the polymer waveguide. Lasing in the cavity without the PMRR is obtained at a center wavelength of 1.910μm, 1.869μm when the PMMR is inserted into the cavity. A maximum power of -5 dBm was extracted from the laser oscillator, and the laser linewidth was measured to be ~26.6 kHz by radio-frequency spectrum analyzer analysis. The PMRR was able to generate an output with a free spectral range of 0.79μm at a frequency of 59.25 GHz. © 2020 Elsevier B.V.

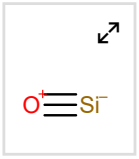
SciVal Topic Prominence

Topic: Whispering Gallery Modes | Microresonators | Microcavities

Prominence percentile: 97.920

Chemistry database information

Substances



Author keywords

Narrow bandwidth | Polymer microring resonator | Thulium–holmium fiber lasers

Indexed keywords

Engineering controlled terms: Bandwidth | Fiber lasers | Fibers | Holmium | Laser resonators | Numerical methods | Resonators | Spectrum analyzers | Thulium

Engineering uncontrolled terms: Free spectral range | Holmium fibers | Laser oscillators | Narrow bandwidth | Polymer microring resonators | Polymer waveguides | Radio frequency spectrum | Ultra-high numerical apertures

Engineering main heading: Polymers

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