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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 PMRR 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.

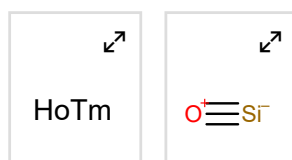
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