Stable dual-wavelength fiber laser utilizing tapered-EDF as comb filter in hybrid Raman-EDF gains

ABSTRACT

A dual-wavelength hybrid Raman-erbium doped fiber ring laser is proposed and demonstrated. By tapering a section of erbium doped fiber ends with two-taper successively, the fiber laser can lase two wavelengths at 1563.08 nm (laser 1) and 1589.5 nm (laser 2). This dual wavelengths output exhibits a good performance having the side mode suppression ratio over 52 dB and acceptably high peak power at -3.2 dBm for both. The lasers also shows high stability at room temperature with peak power variations of less than 0.29 dBm for laser 1 and 0.39 dBm for laser 2 and wavelength drift less than 0.04 nm when observed up to 2 hours of operations.

Keyword: Tapered-EDF; Comb filter; Mach-Zehnder interferometer; Dual-wavelength laser