

Broadly tunable multiwavelength fiber laser with Bismuth-oxide EDF using large effective area fiber.

ABSTRACT

A multiwavelength laser comb using 2.49 m Bismuth-oxide erbium-doped fiber (Bi-EDF) with different lengths of large effective area fiber (LEAF) in a ring cavity configuration is realized. The Bi-EDF is used as the linear gain medium and LEAF is used as the non-linear gain medium for stimulated Brillouin scattering. Out of the four different lengths, the longest length of 25 km LEAF exhibits the widest tuning range of 44 nm (1576 to 1620 nm) in the L-band at 264 mW pump power and 5 mW Brillouin pump power. In addition, a total of 15 output channels are achieved with total average output power of -8 dBm from this laser structure. All Brillouin Stokes signals exhibit high peak power of above -20 dBm per signal and their optical signal-to-noise ratio of greater than 15 dB.

Keyword: Brillouin pump; Brillouin Stokes; Erbium doped fibers.