

Tuning range characteristics of linear cavity L-band multiwavelength Brillouin-erbium fiber laser

ABSTRACT

In this paper, the tuning range characteristics of a multiwavelength L-band Brillouin-erbium fibre laser utilizing a linear cavity is described. The dependency of the Stokes signal tuning range on the laser's pumping power and single mode fibre length is elaborated. The proposed laser configuration exhibited a wide tuning range of 11 nm from 1599 nm to 1610 nm. The maximum number of 28 output channels with a spacing of 10.5 GHz was achieved by setting the Brillouin pump wavelength and power at 1603.1 nm and 1.1 mW, respectively. The wider tuning range and higher number of Brillouin Stokes contributed to the higher efficiency of doublepass amplification in the erbium gain medium and also to the bidirectional generation of Brillouin Stokes in the single-mode fibre.

Keyword: Multiwavelength fibre laser; L-band laser; Optical fibre devices; Non-linear-Brillouin scattering; Tuning range; Stokes signal; Erbium-doped fibre