

Multiwavelength hybrid fiber Raman/parametric linear oscillator

ABSTRACT

We demonstrate a linear cavity wideband multiwavelength fiber-based optical parametric oscillator consisting of four fiber Bragg gratings (FBGs). The FBGs center wavelengths are chosen such that they are 3.2 THz (26 nm) and 14.3 THz (115 nm) away from the parametric pump wavelength, with each located in the dominant region of parametric and Raman gain, respectively. Investigation shows that interplay between the lasing processes from the parametric and Raman gain region can be carefully adjusted to produce multiwavelength lasers spanning from 1436 to 1704 nm, with optical signal-to-noise ratio ranging from 14.3 to 54.0 dB.

Keyword: Parametric oscillators and amplifiers; Nonlinear optics; Stimulated Raman scattering; Fiber lasers