Multi-wavelength generation by self-seeded four-wave mixing

ABSTRACT

A cost effective method of generating multi-wavelength based on the cascaded four wave mixing effect is experimentally demonstrated. The proposed scheme is free from external tunable laser sources and pump modulators, resulting from the use of a broadened linewidth tunable dual wavelength erbium-doped fiber laser as intracavity pump. In this configuration, the number of four wave mixing cascades becomes larger in tandem with the increment of erbium-doped fiber amplifier output power. When its output power is set at 20.57 dBm, six waves having optical signal to noise ratio larger than 10 dB are generated. The six waves are stable with peak power fluctuations less than 1 dB within 30 minutes period and tunable with wavelength spacing ranging from 1.03 nm to 11.31 nm.

Keyword: Four-wave mixing; Fiber laser; Multi-wavelength