

Continuos-wave pumping supercontinuum generation in random distributed feedback laser cavity

ABSTRACT

In this paper, we demonstrated a continuous-wave pumping supercontinuum generation in a random distributed feedback fiber laser with a completely open laser cavity. A broadband wavelength conversion was obtained by pumping a 36-km long TrueWaveREACH fiber in anomalous dispersion regime with a high power continuous-wave Raman laser. The spectral broadening was assisted via nonlinear mechanism such as modulation instability and stimulated Raman scattering. An extended 10-dB flat supercontinuum with 129-nm bandwidth spanning over C-, L-, and U-band wavelengths was generated in the forward direction of lasing cavity under 3.65-W pump power. The super-continuum exhibited excellent bandwidth stability in 60 minutes of lasing operation. A simultaneous generation of random Raman laser operating in the backward direction of cavity was also demonstrated within the same gain fiber. The simple laser cavity presented significant versatility in its generation of novel light sources for both telecommunication and applied science applications.

Keyword: Supercontinuum generation; Random fiber lasers