

## **Flat amplitude multiwavelength Brillouin-Raman comb fiber laser in Rayleigh-scattering-enhanced linear cavity**

### **ABSTRACT**

We investigate the amplitude flatness of Rayleigh-assisted Brillouin-Raman comb laser in a linear cavity in which feedbacks are formed by high-reflectivity mirror. The optimization of Brillouin pump power and wavelength is very crucial in order to obtain a uniform power level between Stokes lines. The Brillouin pump must have a relatively large power and its wavelength must be located closer to the Raman peak gain region. The flat-amplitude bandwidth is also determined by the choice of Raman pump wavelengths. A flat-amplitude bandwidth of 30.7 nm from 1527.32 to 1558.02 nm is measured when Raman pump wavelengths are set to 1435 and 1450 nm. 357 uniform Brillouin Stokes lines with 0.086 nm spacing are generated across the wavelength range. The average signal-to-noise ratio of 17 dB is obtained for all the Brillouin Stokes lines.

**Keyword:** Fiber optics amplifiers and oscillator; Brillouin scattering; Raman scattering