

## **Seamless tuning range based-on available gain bandwidth in multiwavelength Brillouin fiber laser.**

### **ABSTRACT**

We experimentally demonstrate a simple widely tunable multiwavelength Brillouin/Erbium fiber laser that can be tuned over the entire C-band, thereby greatly improving the tuning range limitation faced by the previous Brillouin-erbium fiber laser architectures. Tuning range of 39 nm from 1527 nm to 1566 nm, which is only limited by the amplification bandwidth of the erbium gain was successfully achieved. At Brillouin pump wavelength of 1550 nm and 1480 nm laser pump and Brillouin pump powers of 130 mW and 2 mW respectively, all the generated output channels have peak power above 0 dBm, with the first output channel having a peak power of 8.52 dBm. The experimental set up that consists of only 4 optical components, is simple, devoid of the complex structure employed previously to enhance the tunability and feedback mechanism normally associated with multiwavelength Brillouin-erbium fiber laser sources. The generated output channels are stable, rigidly separated by 10 GHz (0.08 nm).

**Keyword:** Lasers; Erbium; Scattering; Stimulated Brillouin; Nonlinear optics; Fibers