

## **Simple multiwavelength Brillouin-Erbium-doped fiber laser structure based on short SSMF**

### **Abstract**

An efficient multiwavelength Brillouin–Erbium fiber laser (BEFL) was developed by improving the feedback mechanism of Brillouin Stokes lines. The BEFL performance in terms of threshold power and wavelengths count was improved by using a new structure of double pass amplification cavity. The new structure utilized the variable optical coupler (VOA) not only as the input and output ports but also to form a fiber loop mirror that reduces the number of optical components, thus, only three optical components were needed. By optimizing the Brillouin and 1480 nm pump power, up to 41 channels and 26 channels were obtained using 0.6 km and 0.3 km long of standard single mode fiber (SSMF), respectively.

**Keyword:** Fiber lasers; Fiber; Stimulated Brillouin scattering; Rayleigh scattering; Nonlinear optics