

Enhancement of Brillouin gain efficiency in multiwavelength L-band BEFL by utilizing bi-directional Brillouin pump amplification.

ABSTRACT

Enhancement of Brillouin gain efficiency in a multiwavelength L-band Brillouin-erbium comb fiber laser is presented. In this laser architecture, bi-directional amplification of the injected Brillouin pump signal within the erbium gain medium, before entering the single-mode fiber was utilized. Owing to this bi-directional pre-amplification of the Brillouin pump power, the requirement of a long single-mode fiber to increase the Brillouin gain efficiency was overcome. The short length of a single-mode fiber was utilized to achieve a high number of output channels with high peak power. Up to 25 output channels with a constant wavelength separation of 0.089 nm were achieved at 170 mW of 1480 nm pump power and 0.54 mW of Brillouin pump power in a 0.5 km short single-mode fiber.