

Millimeter wave carrier generation based on a double-Brillouin-frequency spaced fiber laser.

Abstract

An all-optical generation of a millimeter wave carrier from a multiwavelength Brillouin-erbium fiber laser is presented. Four-channel output with spacing of about 21.5 GHz is generated from the fiber laser by controlling the gain in the cavity. A dual-wavelength signal with spacing correspondent to six orders of Brillouin frequency shift is obtained by suppressing the two channels at the middle. Heterodyning these signals at the high-speed photodetector produces a millimeter wave carrier at 64.17 GHz. Temperature dependence characteristic of Brillouin frequency shift realize the flexibility of generated millimeter wave frequency to be tuned at 6.6 MHz/ °C.

Keyword: Fiber laser; Stimulated Brillouin scattering; Nonlinear optics.