Tunable Brillouin Opto-Electronic Oscillator based on double fiber loop mirror

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Abstract

Brillouin beam generation from a tuned pump laser source with large spectral width using double fiber loop mirror is proposed. Synthesize of a microwave signal using this simple technique is presented. This technique has been verified experimentally using a tunable laser source. The results show the generation of Brillouin beam using pump laser of output Power 15mW, and fiber loop mirror length 6.6 Km. Then the generated Brillouin beam is injected to the second loop to make a tunable Brillouin opto-electronic oscillator. The second loop consists of signal laser source, electro-optic modulator, 2 Km single mode fiber, optical detector and microwave amplifier (the microwave amplifier is introduced to achieve the required gain to start oscillation, as a result of the low allowed input power to thedetector used, which is 1 mw in this case). The output oscillation frequency is determined by the difference between the signal frequencies of the generated Brillouin beam and the signal laser source in the second loop.

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