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Optical pulses generation of single-cycle and dual-UWB using square and Gaussian electric pulses

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Abstract

In this paper, a method for generating transverse band (UWB) pulses, the basis of which is a large-scale interferometer with a resonator of small silicone rings capable of changing paired configuration, is reported. Single-cycle, dual-bandwidth signals are generated at the time of the picosecond pulse, and the small ring amplifier is modulated with square and Gaussian electric pulses, respectively. Microwave photonic systems that work with large optical components suffer from large size, high energy consumption, high cost, and vulnerability to environmental disturbances. Therefore, it is highly desirable to assemble the microwave photonic system on a single chip to make it more compact, cheap, and low-consumption. They have a low spectrum. One of its applications is in short-range wireless telecommunications and high power for wireless transmission of large multimedia data. It can also be used in low speed and power mode for IoT applications such as precision internal positioning. Unlike the WiFi or Bluetooth distance estimation, which is based on signal intensity, the bandwidth signal has a very narrow pulse width, similar to the radar pulse, which enables it to estimate the position using pulse forward time and 10 cm accuracy. With an intensified modulator based on silicon photonics, one can very hopefully generate an adjustable microwave signal on the chip.

Keywords: ultra-band pulses, intensification, modulation, integrated silicon modulator

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