

Low threshold linear cavity mode-locked fiber laser using microfiber-based carbon nanotube saturable absorber

ABSTRACT

In this work, we demonstrate a linear cavity mode-locked erbium-doped fiber laser in C-band wavelength region. The passive mode-locking is achieved using a microfiber-based carbon nanotube saturable absorber. The carbon nanotube saturable absorber has low saturation fluence of $0.98 \mu\text{J}/\text{cm}^2$. Together with the linear cavity architecture, the fiber laser starts to produce soliton pulses at low pump power of 22.6 mW. The proposed fiber laser generates fundamental soliton pulses with a center wavelength, pulse width, and repetition rate of 1557.1 nm, 820 fs, and 5.41 MHz, respectively. This mode-locked laser scheme presents a viable option in the development of low threshold ultrashort pulse system for deployment as a seed laser.

Keyword: Ultrashort pulse; Pulse fiber laser; Carbon nanotube.