

A Tunable Long-Cavity Passive Mode-Locked Fiber Laser Based on Nonlinear Amplifier Loop Mirror

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Abstract : In this paper, we demonstrate a tunable long-cavity passive mode-locked fiber laser. The mode locker is a nonlinear amplifying loop mirror (NALM). The cavity frequency of the laser is 465 kHz because that 404m SMF is inserted in the cavity. A tunable bandpass filter with ~1nm 3dB bandwidth is inserted into the cavity to realize tunable mode locking. The passive mode-locked laser at a fixed wavelength is investigated in detail. The experimental results indicate that the laser operates in dissipative soliton resonance (DSR) region. When the pump power is 400mW, the laser generates the rectangular pulses with 10.58 ns pulse duration, 70.28nJ single-pulse energy. When the pump power is 400mW, the laser keeps stable mode locking status in the range from 1523.4nm to 1575nm. During the whole tuning range, the SNR, the pulse duration, the output power and single pulse energy have a little fluctuation because that the gain of the EDF changes with the wavelength.

Keywords : fiber laser, dissipative soliton resonance, mode locking, tunable

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