

Passively mode-locked fiber laser by utilizing TTG film on a D-shaped fiber as a saturable absorber

ABSTRACT

In this paper, we propose a mode-locked fiberlaser by utilizing single layer Trivial Transfer Graphene film (TTGF) as a saturable absorber (SA). The SA was deposited on the top of a side-polished D-shaped fiber. The SA was then integrated in the ring cavity configuration, with a clockwise light propagation. Three distinctive 2 m erbium doped fibers (EDFs) those are Metro-Gain15 EDF, Iso-Gain6 EDF and Iso-Gain12 EDF were used as gain media, interchangeable in the experiment. From the results, the Metro-Gain15 EDF gives the most proficient gain medium on generating a passively mode-locked fiber laser. The Metro-Gain15 Erbium doped mode-locked Laser was successfully producing ultrashort pulse with 8 nm spectral band-width, 13 MHz of repetition rate and 915 fs pulse duration. These outcomes demonstrated that TTGF deposited on the D-shaped fiber is a suitable component as an SA to produce a stable output passively mode-locked fiber laser for many optical fiber applications.

Keyword: Mode-Locked fiber laser; Single layer graphene; Erbium doped fiber and ultrashort pulse