

Long-term stability and sustainability evaluation for mode-locked fiber laser with graphene/PMMA saturable absorbers

ABSTRACT

A quality saturable absorber for the integration of a practical laser product with long-term stability and sustainability is of utmost importance to be delivered to end-users. Graphene/polymethyl-methacrylate saturable absorber is proposed with the advantage of gapless material characteristic for ultra-broadband wavelength operation. This saturable absorber possesses stability over 24-hour continuous mode-locked laser operation at 105.2 mW pump power, as well as sustainability over four consecutive observation weeks with the preservation of 670 fs pulse duration within the experimental period. Last but not least, the proposed saturable absorber shows excellent long-term stability and sustainability for the formulation of practical seed mode-locked fiber laser source.

Keyword: Saturable absorber; Mode-locking; Fiber laser; Stability; Sustainability