

ABSTRACT:

A mode locked Titanium sapphire Ti:Al₂O₃ oscillator energized by Diode pumped solid state laser at 532 nm was developed and characterized. The oscillator was aligned based on z-fold cavity. The stability of the output was monitor via the oscilloscope. The mode locked frequency was operated at 75 MHz. The power was detected by high-speed photodiode and digitized on a broadband powermeter. The pulse duration was directly measured via autocorellator. A beam profiler was utilized to record the dynamic expansion of the beam along the Rayleigh region. The average output power of the laser was found to be as 260 mW corresponding the input power of 4 W. The energy of the femtopulse is 3.57 nJ with pulse duration of 50 fs. The focused intensity is achieved almost $4 \times 10^8 \text{ W/cm}^2$ with $M^2 \sim 2$.