



Introduction

This white paper introduces a neoLASE Ytterbium MOPA System with switchable femtosecond or picosecond laser pulse emission. Therefore, this system represents a universal tool for several machining processes such as drilling, cutting, structuring and ablating. Pulse energies of up to 500 μJ and average output powers of up to 100 W, open a wide field of laser applications.

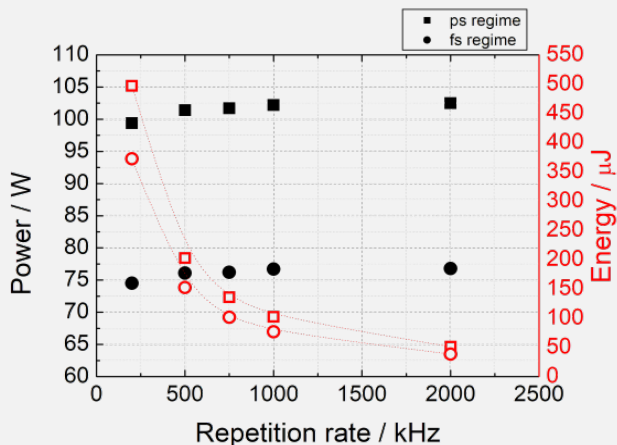
neoMOS: all in one - high energy and high power

In material processing applications, high energy femtosecond pulses have become a powerful tool for example for fast high precision drilling and cutting tasks. On the other hand, high repetition rate picosecond pulses can be used for ablating and structuring. Typically, two different laser beam sources are needed to satisfy all these needs. The new neoMOS "SMAART" Laser provides both operating regimes from just one System.



The system is based on a mode locked fiber oscillator, a pulse picker and up to three neoYb amplifier modules. The pulse duration can be selected by the used oscillator or by an optical switch when femto- and picoseconds pulses are applied.

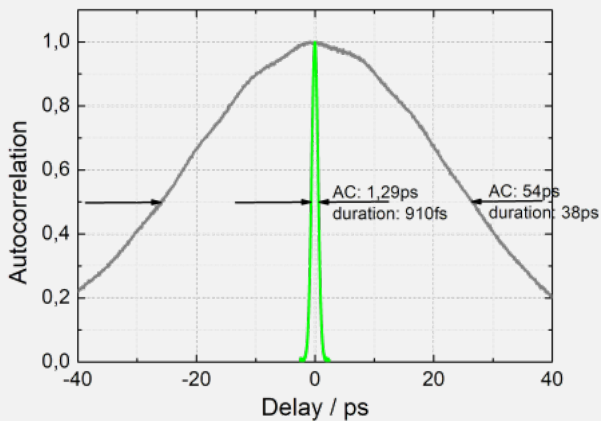
Performance



The output power of the system was measured to be > 100 W for repetition rates between 200 kHz and 2 MHz in the ps-regime. For femtosecond pulses, pulse energies of up to 350 μJ can be reached. The long term power stability was better than 0.5% RMS measured over a period of more than 12 hours.



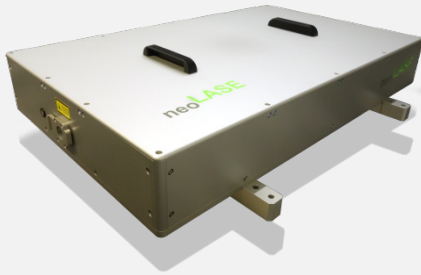
The beam quality factor M^2 was measured smaller than 1.3 in all regimes and the beam roundness was better than 95%.



For two pulse durations the pulses use two different beam paths, of which one includes a grating compressor, which is matched to the seed laser. The switching is realized by a motorized half waveplate and a polarizer, such that also mixed states between the two regimes are also possible. The selected pulse durations have been measured to be 910 fs and 38 ps, respectively.

Design

The footprint measures (750 x 1000) mm, plus an additional 4HU rack for the laser electronics. The seed laser is mounted underneath or near the amplifier head and is connected by a single mode fiber. The system is equipped with the neoCON standard software to control the pulse parameters and monitor system control signals and temperatures. The seed oscillator is fully integrated and also controlled by neoCON software.



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The neoMOS Laser Platform offers a wide range of laser parameters for several kinds of applications. Due to the modular design, the system can be ordered with or without the compressed pulse regime, and with a variety of output powers to optimize your cost-to-value ratio. The unique platform and the neoLASE long term experience enable a high quality production on industrial standards and high reliability. Contact us for your material processing solution on www.neolase.com or info@neolase.com.