Snake Creek Lasers Reaches New Cryogenic Laser Performance Milestones

June 9, 2010
Hallstead, Pennsylvania

Announcement

Snake Creek Lasers President and CTO, Dr. David C. Brown, announced today the achievement of two major Milestones in the company's development of cryogenically-cooled solid-state laser technology:

- A Yb:YAG cryogenically-cooled oscillator-amplifier has produced > **1000 W (1 kW)** of near diffraction-limited output power.

- A mode-locked fiber laser seeded Yb:YAG cryogenically-cooled laser with a double-passed preamplifier and a single-pass power amplifier has produced over **700 W of ultrafast average power**. The laser emits at a 50 MHz (5×10^7) repetition rate, with a pulsewidth of 11 ps (1.1×10^{-11} sec), an energy/pulse of > 13 μJ, and a peak power of > 1.1 MW (1.1×10^6 W). The output beam is near diffraction-limited.

Both laser systems are capable of **sustained** operation for hours or days and are state-of-the-art compact devices.

Previously announced major milestones reached by the company include the demonstration of a 550 W cryogenically-cooled Yb:YAG oscillator with near diffraction-limited output in 2008 and record efficiencies for a solid-state laser system, a cryogenically-cooled Yb:YAG CW oscillator that produces **91.5% slope efficiency**, **86% optical-optical efficiency**, and **100% photon-photon efficiencies**, in 2010.

About Snake Creek Lasers

Snake Creek Lasers, LLC (SCL) provides DoD enabling technologies for High Energy Lasers (HEL) with military and commercial applications including missile defense, laser cutting, drilling, and welding. The development of high average power ultrafast lasers is expected to significantly expand the applications base. The company has been developing proprietary high power cryogenic solid-state laser technology for over ten years. SCL personnel have pioneered technologies leading to dramatically improved thermal management of laser systems, resulting in much smaller, higher efficiency and higher power lasers than previously thought possible. SCL develops Yb:YAG, Ti:Al_2O_3, and other high average power cryogenic solid-state lasers.

Further Information

Government or commercial entities interested in the technology described here are encouraged to contact Dr. Brown. The company has strong interest in teaming and collaborations, and will build custom or OEM systems to meet customer needs. We have particular interest in projects that require harmonic generation, mid-infrared, super-high-efficiency, and shorter fs Ti:Al_2O_3 or other laser sources with much greater average power.

The work described here is being supported by the U. S. Army Research Laboratory in Adelphi, MD.

Compact SCL CW Cryogenic Yb:YAG Laser System

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