



Abstract

Visit at Kansai Photon Science Institute

Dr. Thomas Metzger

thomas.metzger@de.TRUMPF.com

TRUMPF Scientific Lasers GmbH + Co. KG, Feringastrasse 10a, 85774 Unterföhring, Germany, www.trumpf-scientific-lasers.com

High Average Power Ultrafast Thin-Disk Amplifiers

Thin-disk regenerative amplifiers are routinely used for generating multi-millijoule pulses with durations of < 2 ps at kilohertz repetition rates [1-3] and demonstrated recently record values of 220 mJ at 1 kHz [4]. Derived from industrial micro machining lasers [5] and high power cw lasers for laser cutting and laser welding [6], this technology was initially developed for pumping optical parametric chirped pulse amplifiers (OPCPA) [7,8] revolutionizing attosecond technology [9]. Latest results demonstrate that kilohertz thin-disk regenerative amplifiers are scalable beyond the kilowatt average power level uncovering new perspectives of applications. Laser based lightning rod [10,11], X-ray lasers [12] and inverse Compton scattering [13] are among them. The principle of these thin-disk amplifiers operated at ambient temperature is based on chirped pulse amplification. This lecture gives an introduction into ultrafast high power thin-disk laser technology and the current development at TRUMPF Scientific Lasers.

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