

High-resolution laser-scanning-microscopy and processing of biological and technical materials using a new diode pumped solid state femtosecond laser with cavity dumping

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Abstract: Modelocked femtosecond lasers can be applied for nonlinear high-resolution microscopy and as tools for micro- and nanoprocessing of biological and technical materials. Modelocked Ti:Sapphire lasers and other amplified and unamplified systems have been applied as light sources so far. We report on the application of a newly developed diode pumped tunable Yb:glass femtosecond laser oscillator with electro-optical cavity dumping for nonlinear laser-scanning microscopy and processing of biological and technical materials. This new oscillator was coupled into a custom build laser-scanning microscope. The oscillator delivers femtosecond pulses with a high beam quality and peak powers above 1MW at a repetition frequency of approximately 1 MHz.