2.7 W diffraction-limited yellow lasers by efficient frequency doubling of high-brightness tapered diode lasers

Modulated yellow lasers may enable more efficient photocoagulation for treatments of ophthalmic diseases. In this regard, we present a laser system emitting 2.7 W of true-yellow light at 576 nm by frequency doubling the emission of a tapered diode laser emitting 7 W at 1153 nm. The frequency doubling is based on a single-pass configuration using a cascade of two 40-mm periodically poled lithium niobate (PPLN) crystals. The stabilization of the yellow power over 10 h showed a standard deviation of 0.10% and a relative intensity noise of 0.032% rms. Moreover, we demonstrate the generation of yellow pulses with 900 mW of amplitude and a high extinction ratio in the microsecond and millisecond regimes, as required for photocoagulation.

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