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Title:Cascaded continuous-wave singly resonant optical parametric oscillator pumped by a single-frequency fiber laser
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Abstract:We present a cascaded continuous-wave singly resonant optical parametric oscillator (SRO) delivering idler output in mid-IR and terahertz frequency range. The SRO was pumped by an ytterbium-doped fiber laser with 27 W linear polarization pump powers, and based on periodically poled MgO:LiNbO<inf>3</inf> crystal (PPMgLN) in two-mirror linear cavity. The PPMgLN is 50 mm long with 29.5 μm period. The idler power output at 3811 nm was obtained 2.6 W. The additional spectral components that have been attributed to cascaded optical parametric processes are described at increasing pump levels. Besides the initial signal component at about 1476.8 nm, further generated wavelengths with frequency shifts about 47 cm⁻¹, 94 cm⁻¹ and 104 cm ⁻¹ were observed. It was speculated that the idler waves lie in the terahertz (THz) domain from the observed results.
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