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Title:Phase matching for parametric generation in polarization maintaining photonic crystal fiber pumped by tunable Yb-doped fiber laser
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Abstract:Phase matching curves for parametric generation in four wave mixing (FWM) processes of different types are studied experimentally and numerically for a polarization maintaining photonic crystal fiber pumped by a tunable continuous wave ytterbium doped fiber laser near 1 μm. Parametric frequency shifts of up to 100 THz for scalar and pump-divided vector FWM processes are observed providing generation of an idler wave with wavelengths as short as 765 and 758 nm for the two processes, respectively. Explicit analytical solutions for the scalar and polarization phase matching in the vicinity of zero dispersion wavelength have been also deduced. They are based on the phase-mismatch Taylor series expansion taking into account the polarization contribution. A good quantitative agreement between the experimental and calculated frequency shifts is demonstrated. © 2012 Optical Society of America.
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