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标题: Tunable modulational instability sidebands via parametric resonance in periodically tapered optical fibers
作者: Armaroli, A (Armaroli, Andrea); Biancalana, F (Biancalana, Fabio)
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摘要: We analyze the modulation instability induced by periodic variations of group velocity dispersion and nonlinearity in optical fibers, which may be interpreted as an analogue of the well-known parametric resonance in mechanics. We derive accurate analytical estimates of resonant detuning, maximum gain and instability margins, significantly improving on previous literature on the subject. We also design a periodically tapered photonic crystal fiber, in order to achieve narrow instability sidebands at a detuning of 35 THz, above the Raman maximum gain peak of fused silica. The wide tunability of the resonant peaks by variations of the tapering period and depth will allow to implement sources of correlated photon pairs which are far-detuned from the input pump wavelength, with important applications in quantum optics. (C) 2012 Optical Society of America
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地址: [Armaroli, Andrea; Biancalana, Fabio] Max Planck Inst Sci Light, Max Planck Res Grp Nonlinear Photon Nanostruct, D-91058 Erlangen, Germany
通讯作者地址: Armaroli, A (通讯作者),Max Planck Inst Sci Light, Max Planck Res Grp Nonlinear Photon Nanostruct, Gunther Scharowsky Str 1-Bau 24, D-91058 Erlangen, Germany.
电子邮件地址: fabio.biancalana@mpl.mpg.de
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