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Title:Nelder-Mead simplex method for modeling of cascaded continuous-wave multiple-Stokes Raman fiber lasers
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Abstract:We propose and demonstrate an effective and computationally compact Nelder-Mead simplex method for the design and modeling of cw cascaded Raman fiber lasers. The Nelder-Mead method is efficient for finding a local minimum of a function of several variables. We employ this classical powerful local descent algorithm to solve the multidimensional problem for the modeling of n'th-order cascaded Raman fiber lasers. With our proposed method, we investigate a linear cascaded Raman fiber laser with a pump wavelength of 1064 nm. The convergence of the proposed method solving the rate equations with boundary conditions is easily and correctly achieved. Our simulation results verify that the proposed method has good computational speed without losing simulation accuracy.
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