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Phase variation of fundamental field induced by cascaded second order nonlinear processes in KTP

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induced phase variation, cascaded second-order processes, the fundamental field, the second-harmonic field

Abstract

In this paper it has been demonstrated by numerical simulation that the intense second harmonic field induces a nonlinear phase change on a fundamental field simultaneously through the cascaded second-order processes. It has been shown that the phase variation depends on both the propagation distance and the incident fundamental field E_1 . The phase variation strongly depends on the wavelength of the fundamental field. With the increase of the wavelength of the fundamental field, most of the phase variation induced by the second harmonic wave on the fundamental wave becomes smaller linearly. It has been also shown that there are some nonlinear regimes in the phase variation. For some wavelengths of the fundamental field, there are some peaks of the decrease or increase of the induced phase variation.



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