## The Temperature Effects on the Coherent Structures Induced by the Modulational Instability in Photovoltaic Photorefractive Crystal Circuit

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The temperature effects on the modulational instability of broad optical beams in a photovoltaic photorefractive crystal circuit has been investigated. The analytic gain formula for the modulational instability has been obtained by applying a linear stability analysis. Non-zero gain of the modulational instability is shown to exist both for positive and negative photovoltaic fields for a wide range of modulational instability frequency. The evolutions of the initial broad beam under the modulational instability are numerically investigated for the BaTiO<sub>3</sub> crystal as a photovoltaic photorefractive medium with a positive photovoltaic field by varying the crystal temperatures. Some symmetric and asymmetric solitary-waves and periodic waves have been shown to exist as results of mutual interactions between the localized beams induced by the modulational instability. Their dynamical behaviour and mutual interaction are sensitive to the variation of crystal temperature.

Key words: Spatial Soliton; Photovoltaic Photorefractive Crystal Circuit; Modulational Instability;

Temperature Effect; Numerical Simulation.

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