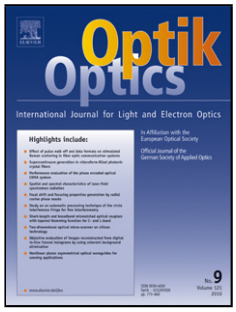

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Theoretical Investigation of Incoherently Coupled Solitons in Centrosymmetric Photorefractive Crystals

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Abstract
A theory on incoherently coupled soliton pairs for photorefractive solitons is developed that gives rise to incoherently coupled soliton pairs and multi-component spatial solitons in biased centrosymmetric photorefractive crystals in all three realizations, bright-bright, dark-dark and grey-grey. The properties and characteristics of these soliton pairs are studied under different conditions like the bias field strength, external and internal resistance, and the intensity of the beams. This theory is extended to incorporate incoherently coupled multicomponent solitons. The stability of the soliton pairs is investigated by the modulation instability theory. A quantitative assessment is made out for the MI gain in all three realizations of the incoherently coupled soliton pairs. These can be established provided the incident beams have the same polarization, wavelength and are mutually incoherent. Relevant examples are also provided to illustrate our results.
Keywords: Photorefractive Effect, Optical spatial solitons, Incoherently coupled solitons, Modulation Instability

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