

Integro-Differential Perturbations of Optical Solitons with Nonlinear Damping

ANJAN BISWAS

Valley City State University, North Dakota.

A Multiple Scale Perturbation Analysis is carried out for the perturbed Nonlinear Schrödinger's equation containing Integro-Differential perturbation terms as well as the nonlinear damping term. An asymptotic solution has been obtained. Thus, the leading solution and the first order correction of the field, with the parameter dynamics, has been obtained. Overall, by introducing an appropriate definition of the phase of the envelope, a consistent slow dynamics, that cannot be captured by the usual soliton ansatz, has been obtained. In the particular case when only the nonlinear damping perturbation term is present, the leading and the first order correction of the envelope has been recovered, including the slow variations of the soliton parameters that has been previously obtained. Finally it will be extended to the integro-differential perturbation terms. Also the comparison between the analytical and numerical results will be presented.