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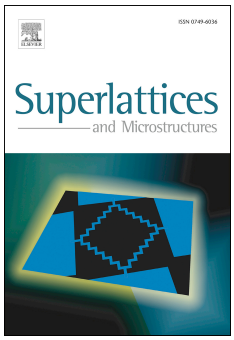

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Muhammad Younis, Hamood ur Rehman, Syed Tahir Raza Rizvi, Syed Amer Mahmood

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Dark and Singular Optical Solitons Perturbation with Fractional Temporal Evolution

Muhammad Younis · Hamood ur Rehman · Syed Tahir Raza Rizvi · Syed Amer Mahmood

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Abstract The article studies the dynamics of dark, singular, combined optical solitons and many other periodic solutions to fractional temporal perturbed nonlinear Schrödinger equation in nonlinear optics. The fractional extended Fan sub-equation method is first time used for any fractional temporal nonlinear Schrödinger equation. The solutions are of qualitatively different nature, depending on the five parameters. The constraint conditions, for the existence of the solitons, are also listed. Moreover a couple of other solutions known as combined soliton and combined periodic solution, fall out as a by product in limiting cases.

Keywords Optical solitons · fractional Fan sub-equation method · perturbed nonlinear Schrödinger equation.

M.Younis
Center for Undergraduate Studies,
University of the Punjab, 54590 Lahore, Pakistan,
E-mail: younis.pu@gmail.com

H.ur Rehman
Department of Mathematics,
University of Okara, Okara, Pakistan,
E-mail: hamood84@gmail.com

S.T.R. Rizvi
Department of Mathematics,
COMSATS Institute of Information Technology, Lahore, Pakistan,
E-mail: strrizvi@gmail.com

S.A. Mahmood
Department of Space Science,
University of the Punjab, 54590 Lahore, Pakistan.
E-mail: amerpakistan@gmail.com