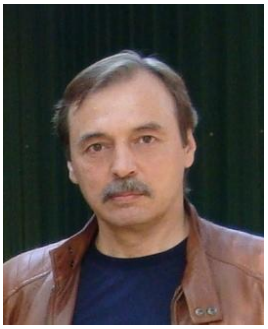

Classification of Multidimensional Solitary Solutions of the GKP Equation by Use of Qualitative and Asymptotic Analysis

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The problem of classification of the multidimensional nonlinear waves and solitons forming on the low-frequency branch of oscillations in complex continuous media with dispersion, including plasmas and fluids, is studied analytically on the basis of the generalized Kadomtsev-Petviashvili (GKP) equation (as partial case of the Belashov-Karpman (BK) system) which takes into account the generalizations relevant to various complex physical media, associated with the effects of high-order dispersion corrections. To construct the classification of solutions on their types we consider the dynamical systems associated with the GKP equation and study the structure of these solutions using the methods of qualitative analysis and analysis of the solutions' asymptotics. We also present some considerations on constructing of the phase portraits of the systems in the 8-dimensional phase space for the GKP equation. As a result, we have constructed a classification of possible multidimensional solutions for the GKP system. This is consistent representation of the both early known and new original results obtained by author and also some generalizations in theory of the nonlinear waves and solitons in complex dispersive media.

Biography

Prof. Vasily Yu. Belashov, PhD (Radiophysics), DSci (Physics and Mathematics). Main fields: theory and numerical simulation of the dynamics of multidimensional nonlinear waves, solitons and vortex structures in plasmas and other dispersive media. He is Chief Scientist and Professor at the Kazan Federal University. He is author of 310 publications including 7 monographs.

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