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Non-autonomous dynamical systems and exact solutions of evolution PDEs.

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Abstract

The present talk is devoted to the new application of S.Lie’s non-autonomous dynamical systems with the generalized separation of variables in right hand-sides, which possess fundamental sets of particular solutions and nonlinear superposition principles. We consider non-autonomous dynamical equations as some sort of external action on a given evolution PDE. The goal of our approach is to find a subset of solutions of evolution equation which possesses the superposition principle. Here we consider the application of the most simple one-dimensional case of the Lie theorem. The solutions of non-autonomous equation will be considered as some kind of symmetry transformations, which act on evolution equation, transforming a subset of solutions into itself. This leads to integration of ordinary differential equations in a process of finding exact solutions of PDEs. We supply the theory with several examples.