

Abstract

Classification of invariant solutions of some nonlinear PDEs using Lie symmetry analysis has been discussed and the underlying optimal systems of subalgebras are presented that classify Lie generators and divide them into disjoint classes. These optimal systems are presented in a tree leaf diagram. Corresponding to each class, complete symmetry reductions and forms of the invariant solutions are presented. Our results also lead to the establishment of the local conservation laws corresponding to each conserved vector via the multiplier approach. This study also examines the variational problem and the associated conservation laws followed by the variational principle.