

*Generalized Infeld–Rowlands equation:  
Nonexistence of local Hamiltonian structures and  
complete description of local conservation laws*

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*Abstract.*

We consider a class of nonlinear partial differential equations in three independent variables that generalizes in a natural fashion the Infeld–Rowlands equation, and show that for all PDEs in this class there are no nontrivial local Hamiltonian structures and no nontrivial local symplectic structures; to the best of our knowledge, this is a first result of the kind in the case of more than two independent variables, and our method of establishing this can be readily applied to many other PDEs.

Moreover, we exhaustively characterize all cases when the equations from the class in question admit nontrivial local conservation laws of any order, and give explicit form of those conservation laws.