λ – Symmetries and unification of techniques for ordinary differential equations

Different methods to search solutions of ODEs are unified by using the λ-symmetry approach. These techniques include reduction in order through some types of nonlocal symmetries, the search of first integrals with the Prelle-Singer method and linearization through generalized Sundman transformations.

Motivation: exponential vector fields

In the book [1] by P. Olver appears the concept of exponential vector fields introduced by P. Olver. The unique prolongations such the system (4) then $V = \partial_t$ is a λ-symmetry for the function λ = −α + β where α and β are defined by (13).

Conclusion: The λ-symmetry approach can be helpful in understanding and unifying apparently no related paths for solving ODEs.

References