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Use of the symmetry-based method to construct non-invertible mappings

In this talk we review the recently introduced symmetry-based method to construct a nonlocally related system for any admitted Lie point symmetry of a given PDE. We focus on how to use the symmetry-based method to find non-invertible mappings that relate nonlinear PDEs to linear PDEs; linear PDEs to other linear PDEs.

Two situations arise for the admitted trivial Lie point symmetries of a linear PDE. A third situation arises for an admitted nontrivial Lie point symmetry of a PDE.