Coverings of differential equations and Lie pseudo-groups

Oleg I. Morozov

March 15 - 16, 2009

Moscow State Technical University of Civil Aviation
Moscow, Russia

Abstract

Coverings, also known as Lax pairs, Wahlquist-Estabrook prolongation structures, or zero-curvature representations, are a convenient framework for dealing with non-local symmetries and conservation laws, inverse scattering transformations, Bäcklund transformations, recursion operators, and deformations of nonlinear partial differential equations. Consequently, the problem of recognizing whether a given PDE has a covering is of great importance. I will talk about one of the possible approaches to solution which use Élie Cartan’s structure theory of Lie pseudo-groups. Examples will include new coverings for the r-th modified dispersionless KP equation and the r-th dispersionless (2+1) Dym equation.