UNIVERSITY OF SASKATCHEWAN

DEPARTMENT OF MATHEMATICS AND STATISTICS

COLLOQUIUM ANNOUNCEMENT

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Title: Point transformations in classes of differential equations

Abstract:
We discuss basic notions of group analysis of differential equations that are related to the problem of group classification of differential equations. This includes the definition of classes of (systems of) differential equations within the framework of group analysis and admissible (form-preserving) point (resp. contact) transformations between equations from a class. Only subsets of transformations that possess the usual (pseudo)group structure are commonly considered in the literature on group analyses of differential equations. Thus, the point symmetry group of a differential equation consists of point transformations in the space of independent and dependent variables that preserve this equation. The equivalence group of a class of differential equations is the set of point transformations in the joint space of variables and arbitrary elements of the class that map each equation from the class to an equation from the same class. At the same time, the whole set of admissible transformations in a class can only be equipped, in general, with the groupoid structure and hence it can naturally be called the equivalence groupoid of the class. A class of differential equations is called normalized if its equivalence groupoid is generated by its equivalence group. We present a procedure for finding equivalence groupoids. The description of an equivalence groupoid may involve different generalizations of equivalence groups, normalized subclasses, mappings between classes, etc. The framework developed allows us to essentially enhance the algebraic method of group classification of differential equations.