

Symmetries, invariants and factor-equations

The main purpose of these lectures is to present a short introduction to the world of differential invariants. We'll discuss symmetry groups and pseudogroups of PDEs and algebras of their differential invariants. The main theorem in the differential invariants theory - Lie-Tresse theorem - shall be discussed in details. We shall explain in details the importance of certain kind of algebraicity in PDEs theory and outline algebro-differential methods for finding differential syzygies and construction of the factor equations. A number of concrete examples shall be considered.