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Symmetry group techniques for differential equations

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Abstract: Symmetry group techniques have long been perceived to be of great significance for the study of the differential equations emanating in mathematics, physics, engineering and many other mathematically-based sciences. Around the middle of the nineteenth century Sophus Lie (1842-1899), the Norwegian mathematician, with the inspiration of the works of Galois and Abel, made a profound discovery that the seemingly unrelated types of equations, such as homogeneous or separable equations were, in fact, all special cases of a general integration procedure. Conserved quantities are intimately connected with symmetry properties of the system, which are in turn very important in their own right. In this talk, we present briefly the applications of symmetry group techniques and conservation laws to differential equations.

Keywords: Lie point symmetries, continuous transformation groups, exact solutions, conservation laws.

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