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**Secondary differential operators.** (English. Russian original) [Zbl 0598.58009](#)

*Sov. Math., Dokl.* 32, 198-202 (1985); translation from *Dokl. Akad. Nauk SSSR* 283, 801-805 (1985).

From the introduction: "Let  $Y$  be a system of nonlinear partial differential equations,  $Y_\infty$  the infinite prolongation of  $Y$ , and  $\text{Sol } Y$  the "manifold" of local solutions of  $Y$ . Since the theory of higher symmetries and  $C$ -spectral sequences of differential equations can be interpreted in a natural way as the theory of vector fields and differential forms on "manifolds" of the form  $\text{Sol } Y$ , it may be expected that other objects in ordinary differential calculus can also be carried over to such "manifolds". A motivation for the expediency of this step and, in particular, its possible significance for quantum field theory were presented by the first author [Differential geometry and its applications, Proc. Conf., Nové Město na Moravě/Czech. 1983, Pt. 2, 289-301 (1984; [Zbl 0558.35060](#))]. In this note we define differential operators of higher orders on objects of the type  $\text{Sol } Y$  (the theory of higher symmetries is equivalent to the consideration of first-order operators) and establish some of their properties. For a number of reasons it is appropriate to call these operators secondary. We confine ourselves for simplicity to a description of "scalar" secondary operators. For this we shall work on manifolds of infinite-order jets of some bundle, despite the fact that all our constructions can be carried out on arbitrary objects in the category of differential equations. Below we present two approaches to the construction of the theory of secondary operators: a geometric approach and a functional approach."

Reviewer: [V.G.Angelov](#)

**MSC:**

- [58C20](#) Differentiation theory (Gateaux, Fréchet, etc.) on manifolds
- [35B60](#) Continuation and prolongation of solutions to PDEs
- [58A20](#) Jets in global analysis
- [58J99](#) Partial differential equations on manifolds; differential operators

**Keywords:**

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