

ON VARIATION BICOMPLEXES ASSOCIATED TO DIFFERENTIAL EQUATIONS*

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Introduction

This paper treats the Vinogradov's spectral sequence E of differential equations ([V1]) in the framework of Gelfand's formal differential geometry ([Ge]), and gives new interpretations of E generalizing formally the secondary characteristic classes and the Bott's vanishing theorems in the foliation theory.

We describe some part of E and the Lie algebra of the symmetries in a way useful for actual calculations. This description yields a quantitative formulation of the Noether theorem as a by-product.

The geometric language adopted here produces also a simple class of correspondences between the solutions of differential equations, which includes the usual Bäcklund transformations.

0.1. In Nice 1970, Gelfand introduced the idea of "formal differential geometry" and suggested its usefulness in investigations of problems involving jets ([Ge]). He and his collaborators realized this in their studies of the Hamiltonian struc-

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