Generalized de Rham-Hodge complexes and integrable multi-dimensional systems of Gromov type

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The differential-geometric aspects of generalized de Rham-Hodge complexes naturally related with integrable multi-dimensional differential systems of M. Gromov type [1], as well as the geometric structure of Chern characteristic classes are studied. Special differential invariants of the Chern type are constructed, their importance for the integrability of multi-dimensional nonlinear differential systems on Riemannian manifolds is discussed. An example of the three-dimensional Davey-Stewartson type nonlinear strongly integrable differential system [2] is considered, its Cartan type connection mapping and related Chern type differential invariants are analized.

References

[1] Gromov M. Partial differential relations. Springer, NY, 1986, 536P.

[2] Prykarpatsky Y.A., Samoilenko A.M. and Prykarpatsky A.K. The de Rham-Hodge-Skrypnik theory of Delsarte transmutation operators in multi-dimension and its applications. Reports on Mathem. Physics, 2005, 55, N3, P.351-363.