The Hodge theory of multidimensional Delsarte transmutation differential operators and its application in nonlinear integrable dynamical systems

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ABSTRACT. The Hodge theory of multidimensional Delsarte-Darboux transmutation operators in parametric functional spaces is studied by means of differential-geometric and topological tools. It is shown that kernels of the corresponding integral operator expressions depend on the topological structure of related homological cycles in the coordinate space. As a natural realization of the construction presented we build pairs of Lax type commutative differential operator expressions (see [1, 2, 4, 5]) related via a Delsarte-Darboux transformations [3] and having a lot of applications in spectral and soliton theories.

References

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