Semi-Lagrangian Methods for Advection-Diffusion of Differential Forms

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We consider generalised linear transient advection-diffusion problems for differential forms on bounded domains that involve Lie derivatives with respect to a prescribed smooth vector field. The Lie-derivative is the generalization of the directional derivative of scalar functions to differential forms and measures the rate of change of the action of a differential form on advected manifolds. We will show how such structural properties can be exploited to formulate and analyze semi-Lagrangian approaches for advection-diffusion of vector fields.

Références

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