PDE-constrained optimization in finite element level set methods

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ABSTRACT

We present optimal control approaches to constraining level set functions in finite element methods for evolving interfaces.

The first method enforces local conservation of mass [2]. The convective flux in the level set equation is corrected while minimizing deviations from a predictive provisional solution.

In the second approach, the level set transport equation is augmented by a source term correcting the slope of the level set function [3,1]. The minimized objective functional is defined by a potential of the residual of the Eikonal equation.

Numerical examples and comparison to other approaches will be presented.

REFERENCES

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