Adjoint-based methods for optimization and goal-oriented error control applied to fluid-structure interaction

Thomas Wick*

* Institute of Applied Mathematics
Leibniz University Hannover
Hannover, Germany
e-mail: thomas.wick@ifam.uni-hannover.de

Key Words: adjoint, fluid-structure interaction, goal-oriented error control, adaptivity, optimization

ABSTRACT

In this presentation, we focus on the adjoint equation in fluid-structure interaction. Derivations for both stationary and nonstationary settings are undertaken. In the latter, the adjoint is running backward-in-time and must access the primal solution due to the nonlinearities. This is a computational challenge, but it is shown that the overall implementation is very promising and numerically robust. We demonstrate the performance in terms of error estimation, space/time adaptivity, and optimal control.

REFERENCES

