

Treating the incompressibility constraint in model reduction and optimal control of flow problems with free boundaries

In the Eulerian formulation, a flow with a free boundary is posed on a domain that changes over time. This time dependency transfers to a time dependency of the discrete operators in a spatially discretized model. In particular, the discrete incompressibility constraint and, thus, the state space for the velocity will depend on time.

Following up on recent developments of POD for adaptive grids, we investigate how a time dependent incompressibility constraint can be incorporated in model reduction and optimal control.

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