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Giorgio Bornia* (giorgio.bornia@ttu.edu). *On a class of boundary optimal control problems in mechanics.*

We discuss Dirichlet boundary optimal control problems for either the Navier-Stokes equations or the elasticity equations together with incompressibility constraints. Such constraints impose integral compatibility conditions on full Dirichlet controls. We compare two different approaches for the treatment of these compatibility conditions: one that is based on the use of a scalar Lagrange multiplier, the other one that uses lifting functions to treat boundary controls as distributed controls. The differences between the two formulations are described. Numerical results are presented for the finite element approximation of the optimality systems arising from the first-order necessary conditions. (Received August 01, 2020)