

**Title:** Error estimates for discontinuous time-stepping schemes for the velocity tracking problem.

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An optimal control problem related to the velocity tracking problem of Navier-Stokes flows is considered. The main goal of the velocity tracking problem is to drive the velocity field near by a given target profile by using distributed controls. The control satisfies pointwise control constraints. The schemes under consideration are based on a discontinuous time-stepping approach combined with standard conforming finite elements for the spacial discretization. Error estimates in terms of suitable projections are established in appropriate norms. Special emphasis will be placed to the role of duality arguments in developing error estimates, and to the role of the related adjoint equation which exhibits very interesting structural properties.