1054-76-207   **Irena Lasiecka** and **Amjad Tuffaha*** (`tuffaha@usc.edu`). *A Bolza Control problem arising in Linearized Fluid-Structure Interaction.*

We consider a Bolza boundary control problem involving a fluid-structure interaction model. We develop an optimal feedback control synthesis based on Riccati theory. The model considered consists of a linearized Navier-Stokes equation coupled on the interface with a dynamic wave equation. The model incorporates convective terms resulting from the linearization of the Navier Stokes equation around equilibrium. The existence of the optimal control and its feedback characterization via a solution to a Riccati equation is established. It is shown that this fluid-structure interaction system does satisfy a Singular Estimate (SE) condition crucial for the application of Riccati theory of optimal control. This is accomplished by showing that the maximal abstract parabolic regularity is transported via hidden hyperbolic regularity of the boundary traces on the interface. Thus, the established Singular Estimate allows for the application of the recently developed general theory which, in turn, implies well-posedness of the feedback synthesis and of the associated Riccati Equation. (Received September 14, 2009)