1038-35-88 **Irena M Lasiecka*** (il2v@virginia.edu), Department of Mathematics, University of Virginia, Charlottesville, VA 22901. *Singular estimates of transfer functions arising in Riccati and H-J equations corresponding to fluid-structure ineteractions.*

Fluid structure model copmprising of parabolic-hyperbolic interaction governed by Navier Stokes equation and dynamic system of elasticity will be considered . The coupling in the structure takes place on the interface between fluid and solid and is prescribed via matching conditions imposed on Cauchy Polya stress tensors and velocities. Riccati and H-J equations associated with optimization via boundary controls will be considered. It is known that the controls supported on the boundary lead to strong singularity of integrals describing the resolvent characterizing Riccati operstors, and as such often result in the lack of well-posedness of the associ ated Riccati equations (with unbounded coefficients). The main aim of this talk is to show that in the case of fluid-structure interaction the singularity of the kernels can be controlled, thus yielding existence of "finite energy" solutions to Riccati operator equations with strongly unbounded coefficients.

The result is based on exploiting sigular estimates resulting from propagation of analyticity from the fluid component and newly established "sharp" trace theory applicable to the hyperbolic component of the system. (Received January 30, 2008)