1107-35-159   **Kristina Martin*** (`kmmarti6@ncsu.edu`), Department of Mathematics, Box 8205 NC State University, Raleigh, NC 27695-8205, and **Lucas Castle**, **Lorena Bociu**, **Daniel Toundykov** and **Jean-Paul Zolesio**. *Optimal Control in a Free Boundary Fluid-Elasticity Interaction.* Preliminary report.

We consider an optimal control problem involving a free boundary fluid-elasticity interaction described by Navier-Stokes coupled with the equations of nonlinear elastodynamics. We prove that turbulence in the fluid flow can be minimized using a distributed control and discuss the first order necessary optimality conditions. This is work in progress in collaboration with Lorena Bociu, Lucas Castle (North Carolina State University), Daniel Toundykov (University of Nebraska, Lincoln), and Jean-Paul Zolesio (INRIA and CNRS-INLN, Sophia-Antipolis, France). (Received January 12, 2015)