1126-35-291   **Roberto Triggiani***, Department of Mathematical Sciences, University of Memphis, Memphis, TN 38152. *Domains of fractional powers of the heat-structure operator with visco-elastic damping: Regularity and control-theoretic implications.*

We consider a heat-structure interaction model where the structure is subject to visco-elastic (strong) damping. The system displays high order boundary coupling at the interface between the two media. If A is the free dynamic operator, we characterize its domains of fractional powers. Implications include optimal (maximal) regularity of the map: boundary control -> solution, where the control acts in the Dirichlet boundary conditions either at the external boundary of the heat-domain, or else at the interface between the two domains. The optimal control theory and min-max game theory then applies with the parameter gamma = 3/4 +(epsilon). (Received January 16, 2017)