1113-35-122 **Roberto Triggiani*** (rtrggani@memphis.edu), **George Avalos** and **Irean Lasiecka**.
*Fluid-structure interaction: Optimal Polynomial decay rate via microlocal analysis.*

We shall focus initially on a simplified model of heat-structure interaction proposed in the literature; later to be replaced by a corresponding fluid-structure interaction (linearized Navier-Stokes equation involving the pressure). We consider the problem of decay of the solution when the initial condition is in the domain of the generator (a problem referred to as rational or polynomial stability). Recent literature provides results with decay rate $\alpha = 1/6$, next $\alpha = 1/2$, finally $\alpha = (1 - \epsilon)$, all these efforts involving a $t$-domain analysis. It was advanced that $\alpha = 1$ gives the optimal decay rate. This paper returns to a prior effort of two of the authors where the rate $\alpha = 1/2$ was obtained by basing the strategy this time on a frequency domain $\lambda$-approach, technically executed via semigroup theory/functional analytic and elliptic theory techniques. We now prove that in fact the decay rate $\alpha = 1$ is obtained, by crucially using a micro-local analysis argument to estimate a critical term involving two boundary traces. This is joint work with G.Avalos and I.Lasiecka. (Received August 16, 2015)