

1161-35-20

**Roberto Triggiani\*** (rtrggani@memphis.edu), 373 Dunn Hall, University of Memphis, Memphis, TN 38152. *Uniform Stabilization of Navier-Stokes Equations and Boussinesq Systems via Finite-dimensional Feedback Controls.*

Two main results will be given (joint with I.Lasiecka and B.Priyasad). First, uniform stabilization of the N-S Eqts in  $d=3$ , by a control strategy that includes a finite-dimensional tangential boundary feedback control acting on an arbitrarily small part of the boundary. Finite dimensionality was known for  $d=2$  (I.Lasiecka-R.Triggiani, NLA 2015), but was an outstanding open problem for  $d=3$ . It required moving into a radically different functional setting of a Besov space with tight indices, which is "close" to  $L^3$  in  $d=3$ . Second, uniform stabilization of a Boussinesq systems, any dimension, on the same Besov setting of low regularity as above, by means of localized interior finite dimensional feedback controls. In both cases the construction of feedback controllers is explicit. Solution to each problem relies - as a starting point - on suitable Unique Continuation Properties of suitable over-determined conditions. Particularly the ones for the Boussinesq systems are new and offer interesting features (R.Triggiani-X.Wan, AMO, 2020) (Received July 22, 2020)