

Unique Continuation Properties of static eigen-problems: the ignition keys for Uniform Stabilization of Fluids by Feedback Controllers

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In dealing with uniform stabilization of unstable parabolic problems, the first critical step is to ascertain Kalman's controllability condition of the projected finite dimensional unstable component. To this end, Unique Continuation Properties for the adjoint problem are needed. Several UCPs are established in [R.Triggiani-X.Wan, AMO, 2021], by using arguments based on Carleman-type estimates of the Laplace operator, specialized from hyperbolic or Schrodinger Carleman-type estimates [Lasiecka-Triggiani-Zhang, early 2000]. These include the required UCPs for the localized interior as well as the localized boundary-based uniform stabilization of an unstable Boussinesq-system, following the case of the Navier-Stokes equations [R.Triggiani, NonLinear Analysis, 2009].