CONTROLLABILITY PROPERTIES OF COUPLED PDES

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In a series of ongoing works with Hugo Lhachemi and Christophe Prieur, we investigate the controllability properties of some coupled PDEs, which can be of different natures.

For a heat-wave PDE with coupling at the boundary, we establish exact, exact null and approximate controllability in appropriate Hilbert spaces, under sharp assumptions. Our approach relies on an Ingham-Mnsz inequality, allowing us to establish an observability inequality for the dual problem. The resulting controllability space, which depends on the coupling function and is characterized in a spectral way, is not a conventional functional space.

If time allows, I will also give some results for other cascade systems, providing new results for coupled heat equations where interesting changes happen at some specific times in the controllability properties.

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