# Controllability properties for systems of $m$ coupled parabolic PDEs

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In this talk we will analyze the controllability properties of a linear coupled parabolic system of $m$ equations when a unique distributed control is exerted on the system. We will see that, when a cascade system is considered with a "local" coupling that intersects the controllability region, we can prove a global Carleman inequality for the adjoint system which bounds the global integrals of the variable $\varphi = (\varphi_1, \dots, \varphi_m)^*$ in terms of a unique localized variable. As a consequence, we will obtain the null controllability property for the system with one control force. For two equations, and without restrictions on the coupling and the control regions, we prove a unique continuation result for the adjoint system equivalent to the approximate controllability of the direct system. Finally, some open problems and questions will be discussed.