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New phenomena for the null controllability of parabolic systems

One of the main goal in control theory is to drive the state of the system to a given configuration using a control that act through a source term located inside the domain or through a boundary condition.

The reference works for the control of linear parabolic problems are due to H.O. Fattorini and D.L. Russell in the 70's for the one dimensional case and to A.V. Fursikov, O.Yu. Imanuvilov on one side and G. Lebeau, L. Robbiano on the other side both in the 90's for the multi-dimensional case. They established null-controllability of heat equations with distributed or boundary controls in any time and for any control domain.

The aim of this talk is to give an overview on the recent results on the controllability of parabolic systems. Through simple examples, I will show that new phenomena appear as minimal time of control, dependance on the location of the control.