

**Lions, J. L.**

**Exact controllability for distributed systems. Some trends and some problems.** (English)

Zbl 0735.93006

Applied and industrial mathematics, Proc. Symp., Venice/Italy 1989, Math. Appl., D. Reidel Publ. Co. 56, 59-84 (1991).

[For the entire collection see [Zbl 0707.00016](#).]

Motivated by questions in solid and fluid mechanics, the author extends his earlier work on controllability questions of distributed systems. After giving a self-contained review of the Hilbert Uniqueness Method [compare SIAM Rev. 30, No. 1, 1-68 (1988; [Zbl 0644.49028](#))] he applies the method in several classes of examples. Considered are examples of control problems governed by the wave operator  $\frac{\partial^2}{\partial t^2} - \Delta$  or the diffusion operator  $\frac{\partial}{\partial t} - \Delta$ . The present methods for those problems are constructive and it is shown how those methods lead in a natural way to numerical algorithms.

In the last section several open problems are indicated which are related to the study of exact controllability for the Navier-Stokes equations.

Reviewer: [J.Rosenthal \(Notre Dame\)](#)

**MSC:**

[93B05](#) Controllability

[35A35](#) Theoretical approximation in context of PDEs

[93C20](#) Control/observation systems governed by partial differential equations

[35B37](#) PDE in connection with control problems (MSC2000)

Cited in **2** Reviews  
Cited in **15** Documents

**Keywords:**

[Hilbert uniqueness method](#); [numerical algorithms](#); [Navier-Stokes equations](#)