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## On the stabilization of bilinear systems in Hilbert space with bounded nonlinear controls

### Communication Info

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### Abstract

This paper addresses the stabilization problem of a class of infinite-dimensional bilinear systems in a Hilbert space and described by the system  $z'(t) = Az(t) + u(t)Bz(t)$ , where  $A$  generates a contraction semigroup  $(S(t))_{t>0}$  on a Hilbert space  $X$ , and  $B : X \rightarrow X$  is a bounded linear operator. Sufficient conditions for strong and weak stabilization of such systems are established using bounded controls. Applications to partial differential equations are provided to illustrate the theoretical results.

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### References

- [1] Ait Aadi and E. Zerrik, *Strong and weak output stabilisation for distributed bilinear systems*, Journal of Control and Decision, 8 (2021), 314–321.
- [2] J. M. Ball and M. Slemrod, *Feedback stabilization of distributed semilinear control systems*, Journal of Applied Mathematics and Optimization, 5 (1999), 167–171.
- [3] L. Berrahmoune, *Stabilization and decay estimate for distributed bilinear systems*, Systems & Control Letters, 36 (1999), 953–969.
- [4] H. Bounit and H. Hammouri, *Feedback stabilization for a class of distributed semilinear control systems*, Nonlinear Analysis, 37 (1999), 837–843.
- [5] M. Ouzahra, *Global stabilization of semilinear systems using switching controls*, Automatica, 48 (2012), 837–843.