Obstruction to the small-time local controllability for a KdV control system

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Abstract

This talk is devoted to the local null-controllability of the nonlinear KdV equation equipped the Dirichlet boundary conditions using the Neumann boundary control on the right. Lionel Rosier proved in [5] that this KdV system is small-time locally controllable for all non-critical lengths and that the uncontrollable space of the linearized system is of finite dimension when the length is critical. Concerning critical lengths, Emmanuelle Crépeau and I proved in [3] that the same result holds when the uncontrollable space of the linearized system is of dimension 1, and later Eduardo Cerpa in [1] , and then Eduardo Cerpa and Emmanuelle Crépeau in [2] established that the local controllability holds at a finite time for all other critical lengths. We present in this talk a recent result [4] showing that, for a class of critical lengths, the nonlinear KdV system is *not* small-time locally controllable.

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References

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