

NEUMANN BOUNDARY CONTROLLABILITY OF THE KORTEWEG-DE VRIES EQUATION

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Resumo/Abstract:

In this talk we present some results concerning the boundary controllability of the Korteweg-de Vries (KdV) equation posed on a finite domain $(0, L)$ with the Neumann boundary conditions. More precisely, we show that the associated linearized system is exactly controllable if and only if the length L of the spatial domain $(0, L)$ does not belong to set

$$R_\beta := \left\{ \frac{\pi}{\sqrt{3(1+\beta)}} \sqrt{k^2 + kl + l^2} : k, l \in N^* \right\} \cup \left\{ \frac{k\pi}{\sqrt{1+\beta}} : k \in N^* \right\},$$

where $\beta \neq -1$. Then the nonlinear system is shown to be locally exactly controllable around a constant steady state β if the associated linear system is exactly controllable. We also present some extensions of our main result to class of dispersive models of the KdV family.

References

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