# STABILIZATION OF A CLASS OF HYPERBOLIC SYSTEMS COUPLED WITH INTEGRO-DIFFERENTIAL EQUATIONS


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Consider a hyperbolic system of the form

$$\frac{\partial w(x,t)}{\partial t} + G(x,c)\frac{\partial w(x,t)}{\partial x} = \psi(x)w(x,t),\ w(x,t) \in \mathbb{R}^n,\ x \in [0,l],\ t \geq 0, \tag{1}$$

subject to the boundary conditions

$$w_i(0,t) = B_i(c)/G_i(0,c),\ (B_i \geq 0,\ G_i > 0,\ i = 1, 2, ..., n), \tag{2}$$

where the function $c = c(t)$ is defined by

$$\frac{dc(t)}{dt} = F\left(c(t), \int_0^l \phi(x)w(x,t)dx, u\right), \tag{3}$$

and $u$ is treated as the control. The above control system was studied as a mathematical model of the continuous crystallization process ($n = 1$) or preferential crystallization of two enantiomers ($n = 2$) in [1], where information about the physical meaning of its state variables and coefficients was also presented.

In this talk, we present a new control design scheme to stabilize the equilibrium of system (1)–(3) by means of a state feedback law for different values of $n$.


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## References


1. *Sklyar G., Zuyev A. (Eds.)* Stabilization of Distributed Parameter Systems: Design Methods and Applications. Springer, 2021.