

**IMPULSE CONTROLLABILITY FOR THE
HEAT EQUATION WITH DYNAMIC BOUNDARY CONDITIONS**

Abstract:

The main purpose of this work is to prove a logarithmic convexity that reflects an observability estimate at a single point of time for the heat equation with dynamic boundary conditions. Therefore, we establish the impulse approximate controllability for the impulsive heat equation with dynamic boundary conditions. Moreover, we obtain an explicit upper bound of the cost of the impulse control. Finally, we present some numerical tests to validate our theoretical results and show the efficiency of the designed algorithm. It is worth mentioning that the impulsive control is a very weak control function that acts only in a subdomain ω and at one time instant $\tau \in (0, T)$, which makes this problem very challenging and generalizes many controllability works of the heat equation in the literature.