

Exact and Approximate Controllability of Nuclear Dynamics Using Bilinear Controls

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Abstract : The control problem associated with nuclear dynamics is represented by nonlinear integro-differential equation with additive controls. To control chain reaction, certain amount of neutrons is added into (or withdrawn out of) chamber as and when required. It is not realistic. So, we can think of controlling the reactor dynamics by bilinear control, which enters the system as coefficient of state. In this paper, we study the approximate and exact controllability of parabolic integro-differential equation controlled by bilinear control with non-homogeneous boundary conditions in bounded domain. We prove the existence of control and propose an explicit control strategy.

Keywords : approximate control, exact control, bilinear control, nuclear dynamics, integro-differential equations

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