On a general degenerate/singular parabolic equation with a nonlocal space term

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Abstract

In this paper we study the null controllability for the problems associated to the operators $y_t - Ay - \frac{\lambda}{b(x)} y + \int_0^1 K(t, x, \tau) y(t, \tau) d\tau$, $(t, x) \in (0, T) \times (0, 1)$ where $Ay := ay_{xx}$ or $Ay := (ay_x)_x$ and the functions a and b degenerate at an interior point $x_0 \in]0, 1/$. To this aim, as a first step we study the well posedness, the Carleman estimates and the null controllability for the associated nonhomogeneous degenerate and singular heat equations. Then, using the Kakutani's fixed point Theorem, we deduce the null controllability property for the initial nonlocal problems.

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