IMPROVEMENT OF THE POLYNOMIAL STABILITY IN THERMOELASTIC BRESSE SYSTEMS UNDER THE FOURIER LAW

Abstract. In this work we have two main goals. The first one is to improve the polynomial decay rates provided by (3). More precisely, by dealing with the thermoelastic Bresse problem stated in (3), we are able to improve both polynomial decay rates $t^{-1/4}$ and $t^{-1/8}$ established for different boundary conditions and regular initial data, as stated in Theorem 4.1 therein. Here, motivated by (4), we prove a new observability result for Bresse systems and employ local estimates through the resolvent equation, along with the general stability result in linear semigroups provided by (1), instead of the approach proposed by (3). Therefore, we prove the optimal decay rate $t^{-1/2}$ for regular initial data independently of any boundary conditions plugged into the system. Secondly, but not least, we also address the optimality issue raised by (2) with respect to the Fourier law, see Remark 4.4 therein.

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