

## ON THE STABILITY OF MIXTURES WITH VARIABLE COEFFICIENTS

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ABSTRACT. We consider the system modelling a mixture of  $n$  materials with frictional damping and we will give sufficient conditions under the coefficients so that the corresponding  $C_0$ -semigroup is exponentially stable. We study the one dimensional model (1) with reference configuration over  $[0, \ell]$ .

$$\mathbf{R}U_{tt} = [\mathbf{A}(x)U_x]_x - \mathbf{B}(x)U_t \quad (1)$$

$$U(0, t) = U(\ell, t) = 0. \quad (2)$$

with  $U = (u^1, u^2, \dots, u^n)$  and  $\mathbf{R} = [\rho_i \delta_{ij}]_{n \times n}$ ,  $\mathbf{A}(x) = [a_{ij}(x)]_{n \times n}$ ,  $\mathbf{B}(x) = [\delta_{ij} b_j(x)]_{n \times n}$ . Where  $\delta_{ij}$  is the Kronecker's delta,  $\rho_i > 0 \forall i$ ,  $\mathbf{A}$  is a positive definite (real) symmetric matrix and  $\mathbf{B}$  a semipositive definite (real) symmetric matrix in  $]0, \ell[$ . We establish the well posedness of the system and we study the exponential stability property.

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