Publicacions més rellevants de la línia de recerca:
Estudi asimptòtic de les solucions de problemes termomecànics

Referència: Magaña, A. and Quintanilla, R. On the time decay of solutions in one-dimensional theories of porous materials. *International Journal of Solids and Structures*, **43 (11-12)** (2006), pp. 3414–3427.

Abstract: In this paper we investigate the temporal asymptotic behavior of the solutions of the one-dimensional porous-elasticity problem when several damping effects are present. We show that viscoelasticity and temperature produce slow decay in time, and the same result is obtained when the porous viscosity is combined with microtemperatures. However, when the viscoelasticity is coupled with porous damping or with microtemperatures the decay is controlled by a negative exponential.

Referència: Magaña, A. and Quintanilla, R. On the time decay of solutions in porous elasticity with quasi–static microvoids. *Journal of Mathematical Analysis and Applications*, **331)** (2007), pp. 617–630.

Abstract: In this paper we investigate the temporal asymptotic behavior of the solutions of the one-dimensional porous-elasticity problem with porous dissipation when the motion of microvoids is assumed to be quasi-static. This question has been recently studied in the general dynamical case. Thus, the natural question is to know if the assumption of quasi-static motion for the microvoids implies significant differences in the behavior of the solutions from the results obtained in the general dynamical case. It is worth noting that this assumption involves a qualitative change in the system of equations to be analyzed because it arises from the combination of a parabolic equation with an hyperbolic one, rather different from the well-known system of the thermo-elastic problem. First, we study the coupling of elasticity with porosity and we show that if only porous-dissipation is present, the decay of solutions is slow, but if viscoelasticity is added, then the solutions decay exponentially. After that, we introduce thermal effects in the system and we show that while temperature brings exponential stability to the solutions, microtemperature does not.

Referència: Alves, M. Muñoz-Rivera, J. and Quintanilla, R. Exponential decay in a thermoelastic

mixture of solids. *International Journal of Solids and Structures*, **46** (2009), pp. 1659–1666.

Abstract: In this paper, we investigate the asymptotic behaviour of solutions to the initial boundary value problem for a one-dimensional mixture of thermoelastic solids. Our main result is to establish a necessary and sufficient condition over the coefficients of the system to get the exponential stability of the corresponding semigroup. We also prove the impossibility of time localization of solutions.