

General decay of solution for a porous-elastic system with weak nonlinear dissipation

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Abstract. In this work the asymptotic behaviour of solution for one-dimensional equations of an homogeneous and isotropic porous elastic solid is analyzed. We use a classic result of P. Martinez [1] to obtain the general decay result. We give some example to illustrate the energy decay rates and consider also the case of the polynomial growth.

1. Introduction

Elastic solids with voids is one of the simple extensions of the theory of the classical elasticity. It allows the treatment of porous solids in which the matrix material is elastic and the interstices are void of material (see Goodman and Cowin [2] and Nunziato and Cowin [3] for details).

It is worth noting that in the last decades, research on porous elastic systems has been made considering various types of dissipative mechanisms. We describe here some of the main results. To do this, let us consider the following evolution equations in one-dimensional case

$$\begin{cases} \rho u_{tt} = T_x, \\ J\phi_{tt} = H_x + G. \end{cases} \quad (1.1)$$

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