Abstract

Mixed FEM, PEERS, Elasticity.

SUMMARY. We present an innovative method for the analysis of viscoleastic plane systems based on a truly-mixed Hellinger-Reissner variational principle, wherein stresses and velocities are the main variables and Lagrange multipliers, respectively. Our discretisation adopts the Arnold–Winther element [**?**] as to the stress variables along with usual elementwise-linear displacements. An extension to the dynamic case is also introduced and discussed.

1 NOTAZIONI

Per convenienza e compattezza si indicherá per distinguere vettori da scalari una linea sottostante, mentre per distinguere vettori da tensori rispettivamente una linea e due linee sottostanti. Definiamo alcuni operatori che saranno utili nel proseguo della trattazione. Date le funzioni η, $\underline{v}$ e $\underline{\underline{\tau}}$ su Ω, definiamo i seguenti operatori:

$$\underline{rot}\eta = \left(\frac{\partial \eta}{\partial y}, -\frac{\partial \eta}{\partial x}\right), \tag{1}$$

$$rot\underline{v} = -\frac{\partial v_1}{\partial y} + \frac{\partial v_2}{\partial x}, \tag{2}$$

$$\underline{div}\underline{\underline{\tau}} = \left(\frac{\partial \tau_{11}}{\partial x} + \frac{\partial \tau_{12}}{\partial y}, \frac{\partial \tau_{21}}{\partial x} + \frac{\partial \tau_{22}}{\partial y}\right), \tag{3}$$