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Title: Reproductive solutions of the g-Navier-Stokes and the g-Kelvin-Voight equations

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Abstract: The goal of this work is to present a existence of the reproductive solution of the g- Navier-Stokes equations:

$$\begin{cases} \dfrac{\partial \boldsymbol{u}}{\partial t} - \nu\Delta\boldsymbol{u} + (\boldsymbol{u}\cdot\nabla)\boldsymbol{u} + \nabla p &= \boldsymbol{f}, \quad \text{in }]0,T[\times\Omega, \\ \dfrac{1}{g}(\nabla(g\boldsymbol{u})) = \dfrac{\nabla g}{g}\cdot\boldsymbol{u} + \nabla\cdot\boldsymbol{u} &= 0, \quad \text{in }]0,T[\times\Omega, \end{cases} \tag{1}$$

here $\boldsymbol{u}$ is the velocity of the fluid p is the pressure and $g \in W^{1,\infty}(\Omega)$. We reach in this way, for weak solutions, basically the same level of knowledge as in the case of the classic Navier-Stokes equations. More precisely, we prove the existence os a solution of (1) satisfying $\boldsymbol{u}(0) = \boldsymbol{u}(T)$.

References

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