

## Bayesian assessment of viscoelastic damping models

**Fernando Rochinha, Reniene Santos, Daniel Castello**

*Abstract:* Advanced damping materials, due to their ability to dissipate mechanical energy, have been increasingly employed to mitigate damage in engineering devices operating in harsh environments. This damage is produced by induced vibrations that might be attenuated by passive or active structural control. The conception, design and real-time operation of such sort of strategy heavily relies upon modeling and computational simulation. In the present work, the initial objective is to construct reliable constitutive models that are based on internal variables for viscoelasticity in small deformations. These variables were added with the intention of representing the deformation of irreversible systems, such as viscoelasticity. Although the internal variables models are not being extensively used, they have gained a lot of attention because of their accuracy in modeling the damping of the material and in its ability to deal with frequency and temperature dependence in the time domain. we employ a Bayesian approach to carry out an analysis about the ability to reproduce the observable inelastic behavior when internal variables are used in the modeling. This analysis focus on the use of different constitutive models with special emphasis in small number of internal variables. Here, our strategy relies on confronting the results from a higher fidelity model with those obtained with a lower one. The degree of accuracy is assumed to be dictated by the number of internal variables in the hierarchical family of models

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- 1) Fernando Rochinha, Professor: Universidade Federal do Rio de Janeiro, Eng. Mecanica. Centro de Tecnologia. Cidade Universitaria. G-201. Ilha do Fundao. rio de Janeiro. RJ, Brazil (BR), [faro@mecanica.coppe.ufrj.br](mailto:faro@mecanica.coppe.ufrj.br), the author presented this contribution at the conference in the special session: "Innovative strategies for vibration control and mitigation" organized by G. Failla and R. Santoro.
  - 2) Reniene Santos, M.Sc. (Ph.D. student): Universidade Federal do Rio de Janeiro, Eng. Mecanica. Centro de Tecnologia. Cidade Universitaria. G-201. Ilha do Fundao. rio de Janeiro. RJ, Brazil (BR), [renienemus@hotmail.com](mailto:renienemus@hotmail.com).
  - 3) Daniel Castello, Associate Professor: Universidade Federal do Rio de Janeiro, Eng. Mecanica. Centro de Tecnologia. Cidade Universitaria. G-201. Ilha do Fundao. rio de Janeiro. RJ, Brazil (BR), [dnl.castello@gmail.com](mailto:dnl.castello@gmail.com).