FINE-TUNING OF MODELLING STRATEGY TO SIMULATE THERMO-MECHANICAL BEHAVIOUR OF DOUBLE FRICTION PENDULUM SEISMIC ISOLATORS

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Abstract:
The use of friction pendulum devices has recently attracted the attention of both academic and professional engineers for the protection of structures in seismic areas. Although the effectiveness of these has been shown by the experimental testing carried out worldwide, many aspects still need to be investigated for further improvement and optimisation. A thermo-mechanical model of a double friction pendulum device (based on the most recent modelling techniques adopted in multibody dynamics) is presented in this paper. The proposed model is based on the observation that sliding may not take place as ideally as is indicated in the literature. On the contrary, the fulfilment of geometrical compatibility between the constitutive bodies (during an earthquake) suggests a very peculiar dynamic behaviour composed of a continuous alternation of sticking and slipping phases. The thermo-mechanical model of a double friction pendulum device (based on the most recent modelling techniques adopted in multibody dynamics) is presented. The process of fine-tuning of the selected modelling strategy (available to date) is also described.

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