

NON LINEAR ELECTROMECHANICAL PHENOMENOLOGICAL MODELS FOR MANGANIN AND YTTERBIUM STRESS GAGES

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Abstract : *The response of materials or structures under severe dynamic loadings such as an impact or an explosion can be investigated through shock wave experiments. A difficulty encountered lies in the continuous measurements of the stress waves evolutions inside a sample. One of the most interested measurement technique is based on the use of embedded piezoresistance gages. By monitoring the resistance change in the foil gage due to both variation in dimensions and resistivity, stresses levels reached during loading, unloading and reloading phases can be determined. This paper focuses on enhancements in phenomenological electromechanical models. The proposed modeling are piezoelectric-elastoplastic with an isotropic hardening for manganin gages and piezoplastic-elastoplastic with a kinematic hardening for ytterbium gages. The models responses are faced to the available literature data.*