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VIBRATION ATTENUATION IN LAMINATED SOFT CORE SANDWICH PANELS WITH ACTIVE PIEZOELECTRIC ELEMENTS

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Summary: In this paper we present a finite element model for the analysis of sandwich laminated plates with a soft core and composite laminated face layers, as well as piezoelectric sensor and actuator layers. The model is a generalisation of the element developed by Araujo et al. [1] for active and passive damping of soft core sandwich plates, where the transverse compressibility of the core is included. The model is formulated using a mixed layerwise approach, by considering a higher order shear deformation theory (HSDT) to represent the displacement field of the compressible core and a first order shear deformation theory (FSDT) for the displacement field of the adjacent laminated face layers and exterior piezoelectric layers. Control laws are implemented and the model is validated for free and forced vibrations with results from the literature [2,3,4] and the effect of the core transverse compressibility is assessed on modal damping and frequency response.

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