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STRUCTURAL-ACOUSTIC VIBRATIONS WITH DISSIPATIVE INTERFACE

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ABSTRACT

This work concerns the variational formulation and the numerical computation of vibroacoustic interior problems with interface damping.

The coupled system consists of an elastic structure (described by a displacement field) containing an inviscid, compressible and barotropic fluid (described by a pressure field), gravity effects being neglected.

Within the context of noise reduction techniques, we propose to investigate the effect of introducing a thin layer of damping material at the fluid-structure interface.

The originality of this work lies in the introduction of an additional unknown field at the fluid-structure interface, namely the normal fluid displacement field.

With this new scalar unknown, various interface damping models can be introduced in the variational formulation. Moreover, the associated finite element matrix system can be written in a symmetric form and directly solved in frequency and time domains.

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