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TENSION MODULATED NONLINEAR 2D MODELS FOR DIGITAL SOUND SYNTHESIS WITH THE FUNCTIONAL TRANSFORMATION METHOD (MonPmOR11)

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✱ Abstract :

Tension modulated nonlinearities for the modeling of string instruments are well known to increase the quality of synthesized sounds significantly. These models consider the nonlinear feedback from the string's deflection to one of its physical parameters, the string tension. Obviously this effect occurs for two dimensional models, drums or plates for instance, too, however so far only non real–time implementations are available. Therefore in this paper a new approach is presented, where the functional transformation method (FTM) is applied. The mathematical model of a dispersive and damped membrane is set up including an additional term for the tension modulated nonlinearity. Using some slight simplification this model is solved with the FTM and, thanks to the scalability of the FTM, implemented in real–time.

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