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A New Method Development in Time Domain Simulation of Non-Linear Aero-Elastic Vibrations

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Non linear aero-elastic behavior is examined. This research extends the effort of several dynamic modeling that includes the existence of structural non-linear factors such as: free-play and softening/hardening spring effects. The authors consider the flutter phenomena as a dynamic system constructed in the form of power bond graph. The external loads of the system are modeled as an unsteady aerodynamic filter based on Padé approximation rational function. By converting the bond graph model into equivalent block diagram, the analysis of structural response can be carried out directly in time domain that may enable to model the non-linearity accurately.

Key words: *non-linear flutter, system dynamics, bond graph, modeling and simulation.*