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**James Cameron\*** (jcameroa@masonlive.gmu.edu), 6105 Backlick Road, Springfield, VA 22150, and **Charles Daly** and **Padmanabhan Seshaiyer**. *Mathematical Modeling and Analysis of a Nonlinear Large Deformation Plate Model with Applications to Micro Air Vehicles*. Preliminary report.

In this work we consider the development of a computational methodology to study stability and nonlinear dynamics of large deformation plate models. The main application is the computational modeling of flexible wing designs for Micro Air Vehicles. Using a geometrically nonlinear Green strain-displacement formulation, a materially linear constitutive stress-strain formulation, and a Hamiltonian energy approach, we develop the governing differential equations for the axial and transverse displacements of the plate. We also develop an appropriate energy norm for a class of boundary conditions and prove a stability estimate. The model developed will be numerically validated for benchmark applications. (Received September 21, 2011)