1145-35-710 **Earl H Dowell*** (earl.dowell@duke.edu), **Kevin McHugh** and **Maxim Freydin**. *Nonlinear Response of an Inextensible, Cantilevered Beam/Plate Subjected to a Nonconservative Force.*

The dynamic stability of a cantilevered beam/plate excited by a nonconservative follower force has been studied previously for its interesting dynamical properties and its application to engineering systems such as launch vehicles under thrust loads. However most of the literature considers a linear model. Here a system of nonlinear ordinary differential equations is derived from a new Hamilton's Principle approach for an inextensible beam/plate with a non-conservative force acting upon it. The equations are solved numerically by a time marching algorithm and agreement is shown with published data for the critical bifurcation force. The model readily allows the determination of both in-plane and out of plane deflections. The nonlinear post-critical limit cycle oscillations are also studied. Then it is shown how a different nonconservative force can be incorporated into the model due to the hypersonic flow over the beam/plate. (Received September 13, 2018)