

1989

# Nature of coupling in nonconservative lumped parameter systems

Bellos, John

American Institute of Aeronautics and Astronautics

---

<http://hdl.handle.net/11728/92>

*Downloaded from HEPHAESTUS Repository, Neapolis University institutional repository*

<b>Title:</b>	<b>NATURE OF COUPLING IN NONCONSERVATIVE LUMPED PARAMETER SYSTEMS</b>
<b>Year:</b>	1989
<b>Author:</b>	Bellos, John ; Inman, Daniel
<b>Abstract:</b>	Although the response of undamped or at least proportionally damped linear systems can be determined easily by modal analysis, the prediction of the response of nonproportionally damped linear systems requires either more extensive computations or some convenient assumptions and approximations. The primary objective of this paper is to present an approximate method that, by performing simple calculations, takes into account the coupling between the modes and leads to a closed-form solution concerning the response of the system. The proposed decoupling process, subject to practically no restrictions, is simple enough to conceive and accurate and reliable enough to apply. The development of the nonproportionality indices presented here focuses on the measurement of the modal coupling existing in the system and the qualitative prediction of the system behavior.