

**Coller, B. D.; Chamara, P. A.**

**Structural non-linearities and the nature of the classic flutter instability.** (English)

Zbl 1236.74103

J. Sound Vib. 277, No. 4-5, 711-739 (2004).

Summary: We present an investigation of the subcritical/supercritical nature of the flutter Hopf bifurcation of a two degree of freedom with linear, quadratic, and cubic restoring forces. Under certain conditions, the instability gives rise to stable limit cycle oscillations, whereas unstable periodic orbits appear for other conditions, providing a potentially dangerous non-linear instability mechanism in regimes for which linear analyses predict stability. The analytic approach employed herein, allows for a more thorough investigation of the high-dimensional parameter space than that afforded by others' experimental and computational efforts. Counterexamples to previously held conjectures are readily found. Favorable comparisons are made to predictions based on less rigorous describing function or harmonic balance techniques.

**MSC:**

[74H45](#) Vibrations in dynamical problems in solid mechanics

[74H55](#) Stability of dynamical problems in solid mechanics

Cited in **11** Documents

**Full Text:** [DOI](#)