

**Inspurger, T.; Stépán, G.**

**Stability chart for the delayed Mathieu equation.** (English) [Zbl 1056.34073](#)  
Proc. R. Soc. Lond., Ser. A, Math. Phys. Eng. Sci. 458, No. 2024, 1989-1998 (2002).

Summary: In the space of system parameters, the closed-form stability chart is determined for the delayed Mathieu equation defined as  $\ddot{x}(t) + (\delta + k \cos t)x(t) = bx(t - 2\pi)$ . This stability chart makes the connection between the Strutt-Ince chart of the Mathieu equation and the Hsu-Bhatt-Vyshnegradskii chart of the second-order delay-differential equation. The combined chart describes the intriguing stability properties of a class of delayed oscillatory systems subjected to parametric excitation.

**MSC:**

- [34K20](#) Stability theory of functional-differential equations
- [34C15](#) Nonlinear oscillations and coupled oscillators for ordinary differential equations
- [70K40](#) Forced motions for nonlinear problems in mechanics

Cited in **22** Documents

**Keywords:**

[parametric excitation](#); [time delay](#); [stability](#)

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