

論文 / 著書情報
Article / Book Information

題目(和文)	ブレーキスキールを対象とした摩擦励起振動の特性解析とロバスト安定化制御法
Title(English)	Characteristic investigation and robust active stabilization methods for friction-induced vibrations - Special study for disc brake squeal
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(博士課程)
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論文概要

THESIS ABSTRACT

専攻 : Department of	Mechanical and control Engineering	専攻	申請学位 (専攻分野) : Academic Degree Requested	博士 Doctor of	Philosophy
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概要 (和文 300 字程度又は英文 120 語程度)
Thesis Abstract (approx.300 Japanese Characters or approx.120 English Words)

As friction couples tangential and lateral degrees-of-freedom of a structure at contact interfaces, the resulting asymmetric system is prone to dynamic instability. Once those systems become unstable, along with large-amplitude vibrations known as friction-induced vibrations, annoying noises always emit. Moreover, due to uncertainties in manufacturing and operational conditions, friction-induced vibrations are intricate and fugitive.

This research investigates brake squeal as a typical case of friction-induced vibrations. Using a simplified finite element model of a brake system, the complex eigenvalues and dynamic transient analyses are performed to demonstrate the underlying mechanisms. The experimental modal test and squeal experiment are implemented to provide constructive guidance to study brake squeal. Utilizing the ensemble empirical mode decomposition, detailed characteristics of brake squeal are extracted. Specially, this research develops robust active stabilizing methods for friction-induced vibrations.