The mathematical modeling and numerical analysis of aeroelastic phenomena in turbomachines

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Course description:

In modern turbomachinery design and development it is important to predict the aeroelastic behaviour of blades. This is especially true for aircraft compressor and fan blade rows, but also for the last stages of steam and gas turbines that may work at highly loaded off-design conditions. In real flows unsteady phenomena connected with circumferential non-uniformity of the main flow and these caused by oscillations of blades are observed only jointly. An understanding of the physics of the mutual interaction between gas flow and oscillating blades and the development of predictive capabilities are essential for improved overall efficiency, durability and reliability. The aim of these lectures is to present the mathematical model and the numerical method of the coupled fluid-structure solution for 3D flow through the turbine (compressor) stage with taking into account the blade oscillations, but without separating the outer exitation and unsteady effects due to the blade motion.

There shown the comparison of the numerical results with experimental data for standard configurations STC1, STC4, STC11. The numerical analysis results of the amplitude-frequency characteristics of unsteady forces and rotor blades oscillations for a steam turbine last stage with 760 mm rotor blades and aircraft engine compressor are presented.

Błąd! Nie można odnaleźć pola korespondencji seryjnej w rekordzie nagłówkowym źródła danych.

TERMINY WYKŁADÓW			
Data	**Dzień tygodnia**	**Godzina**	**Sala**
2012-10-08	Poniedziałek	10-14	Audytorium IMP PAN
2012-10-09	Wtorek	10-14	Audytorium IMP PAN
2012-10-10	Środa	10-14	Audytorium IMP PAN
2012-10-11	Czwartek	10-14	Audytorium IMP PAN