



27^{ème} Séminaire Franco-Polonais de Mécanique
6 & 7 Juin 2019, Besançon, FRANCE

Book of Abstracts

Commites

Local Organizing Committee

BOUHADDI Nouredine	FONTAINE Michaël	FROIDEVAUX Christine
GUICHERET-RETEL Violaine	KACEM Najib	MAILLOTTE-NAVARRO Isabelle
NARDIN Philippe	TRAVAGLINI Delphine	WALTER Vincent

Scientific Committee

Coordonnateurs: J. BAJKOWSKI (Varsovie), M. SOFONEA (Perpignan) & P. NARDIN (Besançon)

M. ABID (Sfax)	S. ABIDE (Perpignan)	P. ALART (Montpellier)
J. AWREJCEWICZ (Łódź)	C. BAJER (Varsovie)	J.M. BAJKOWSKI (Varsovie)
M. BAJKOWSKI (Varsovie)	M. BARBOTEU (Perpignan)	A. BELGHIT (La Rochelle)
W. BLAJER (Radom)	N. BOUDEAU (Besançon)	M. DUDZIAK (Poznań)
E. FLORENTIN (Bourges)	J. GAWLIK (Cracovie)	J. GIERGIEL (Rzeszów)
M. GIERGIEL (Cracovie)	M. GRZEGORZEWSKI (Deblin)	V. GUICHERET- RETEL (Besançon)
M. HAC (Varsovie)	M. HADDAR (Sfax)	J. HOLNICKI-SZULC (Varsovie)
R. KONOWROCKI (Varsovie)	J. KOWAL (Cracovie)	W. KURNIK (Varsovie)
F. LEBON (Marseille)	G. LE PALEC (Marseille)	B. MAGNAIN (Bourges)
K. MARCHELEK (Szczecin)	A. MAZURKIEWICZ (Radom)	A. MEZYK (Gliwice)
S. MIGORSKI (Cracovie)	W. OSTACHOWICZ (Gdańsk)	S. PAGANO (Montpellier)
M. PYRZ (Lille)	S. RADKOWSKI (Varsovie)	A. RADOMYSKI (Deblin)
E. RUSINSKI (Wrocław)	A. SEWERYN (Białystok)	M. SHILLOR (Detroit)
J. ŚWIDER (Gliwice)	E. ŚWITONSKI (Gliwice)	A. TYLIKOWSKI (Varsovie)
V. WALTER (Besançon)	J. WARMINSKI (Lublin)	K. WOZNICA (Bourges)
R. ZALEWSKI (Varsovie)	B. ZEGHMATI (Perpignan)	D. ZIED (Sfax)



Historic overview :

French-Polish mechanics seminars are annual scientific events highlighting French-Polish collaboration in the broad field of mechanics and their various applications. Alternatively organized in France and Poland these scientific events have allowed both French and Polish researchers to strengthen and diversify a successful cooperation over the past 25 years.

The last edition of the seminar was held on May 14th-15th, 2018 and was hosted by the Faculty of Automotive and Construction Machinery Engineering of the Warsaw University of Technology under the auspices of the PAN (Polish Academy of Sciences), in Warsaw.



Objectives and addressed topics :

The French-Polish seminars in mechanics are primarily intended for young french or polish researchers so as to present their early research work. The aim of these seminars is to gather mechanics or physics researchers and engineers, mathematicians, who work in these following thematic fields: two-phase flow, mechanical systems dynamics, identification of parameters for modelling mechanical processes, solid mechanics, fluid mechanics, mechanics of materials, contact mechanics, numerical methods, heat transfer and viscoplasticity.

This wide variety of topics gives to these seminars an eclectic nature, especially since the next edition will shed an original light on Vibrations of Structures or on Energy Storage.



27^{ème} Séminaire Franco-Polonais de Mécanique
6 & 7 Juin 2019, Besançon, FRANCE



Robert Konowrocki¹, Dominik Pisarski, Tomasz Szolc

Institute of Fundamental Technological Research, Polish Academy of Sciences

An influence of electromechanical coupling effects on instability of the high speed trains driven by direct-drive induction motor

Abstract

The knowledge about torsional vibrations of drive transmission systems of railway vehicles is of a great importance in the dynamics of such mechanical systems. To ensure a reliability and unconditional security of high speed electric multiple unit (HSEMU) drive by AC motors, the electromagnetic output traction force and torques should drive stably. Otherwise, the shaft train vibration caused by motor torque ripple will affect a fatigue life of this device and the operation on the driven object.

For this reason, in the paper dynamic electromechanical interactions between the railway drive system and their driving synchronous motor are investigated. Theoretical considerations have been performed by means of the advanced electromechanical model of the considered HSEMU drive system. Numerical simulations were carried out for run-ups of the considered railway drive system.

The results obtained from this numerical investigation results demonstrate an important influence of the electromagnetic negative damping occurring in a synchronous motor on a possibility of excitation of transient and resonant torsional vibrations in railway drive system. Conclusions drawn from the computational results can be very useful during a design phase of these objects. Moreover, they may lead to a maintenance improvement of railway drive systems.

¹ Corresponding author: rkonow@ippt.pan.pl



27^{ème} Séminaire Franco-Polonais de Mécanique
6 & 7 Juin 2019, Besançon, FRANCE

Sponsors



The seminar is awarded as 'flagship event' for the 2019 french-polish scientific year

