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Faculty of Mechanical Engineering*



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PREFACE

Dear colleagues,

DEMI Conference has brought us together for the 11th time to show the current state of research in the field of Mechanical and Electrical Engineering as well as Information Technology.

From the very beginning, the Conference has aimed strengthening cooperation between companies and science. However, we live at the time of a severe economic crisis that even affects the richest economies. Furthermore, stagnation of the real economy and unemployment are present in technologically developed countries, whereas investments in the R&D sector are small, all of which reflects on the field of scientific research.

There was concern that such a state of the economy may cause a lack of interest and potential of scientific workers to participate actively in the work of scientific conferences. However, DEMI will not flinch. With great pleasure, I would like to point out that the DEMI 2013 Conference gathered a record number of participants so far. The Conference Proceedings contains 174 papers by authors from 14 countries. Scientists and researchers have traditionally been the most active in the field of Production Technology and Engineering (41 papers), followed by Energy and Thermal Engineering (37 papers), Mechanics and Design (28 papers), Transport Vehicles and Transportation (23 papers), Mechatronics (20 papers), Maintenance of technical systems, Occupational safety (17 papers).

On behalf of Organizational Board of the 11th International Conference on Accomplishments in Electrical and Mechanical Engineering and Information Technology, DEMI 2013, I wish all our guests a warm welcome to Banja Luka and successful work to all participants. Furthermore, I would like to express my gratitude to all the authors, members of the Scientific Committee, institutions, companies and individuals who have contributed to successful organization of the DEMI 2013 Conference.

In Banja Luka, May 2013
Chair of DEMI 2013 Organizational Board
Valentina Golubović-Bugarski

PREDGOVOR

Poštovane kolege,

Konferencija DEMI okupila nas je po 11. put da prezentujemo trenutno stanje istraživanja u području mašinstva, elektrotehnike i informacionih tehnologija.

Konferencija DEMI odavno je za svoj cilj postavila jačanje oblika saradnje između privrednih preduzeća i nauke. Međutim, živimo u vrijeme teške ekonomske krize koja pogađa i najbogatije ekonomije, stagnacija realne privrede i nezaposlenost prisutni su i u tehnološki najrazvijenijim zemljama, ulaganja u razvoj i istraživanja su mala, što se sve reflektuje i na područje naučnih istraživanja.

Postojala je bojazan da će ovakvo stanje privrede uzrokovati i manjak interesovanja i mogućnosti naučnih radnika da aktivno učestvuju u radu naučnih konferencija. Ipak, DEMI ne posustaje.

S posebnim zadovoljstvom ističem da je Konferencija DEMI 2013 okupila do sada rekordan broj učesnika. U zborniku radova objavljeno je 174 radova autora iz 14 zemalja. Naučnici i istraživači tradicionalno su najaktivniji u području Proizvodnih tehnologija i inženjerstva, a rezultati istraživanja u ovom području saopšteni su kroz 41 radova. Slijede područje Termotehnike i energetike (37 radova), Mehanika i konstrukcije (28 rada), Saobraćaj i transportna sredstva (23 rada), Mehatronika (20 radova) i Održavanje tehničkih sistema i zaštita na radu (17 radova).

U ime Organizacionog odbora Konferencije DEMI 2013 iskazujem svim našim gostima toplu dobrodošlicu u Banju Luku i želim uspješan rad učesnicima Konferencije. Takođe, zahvaljujem se svim autorima, članovima Naučnog odbora, institucijama, firmama i pojedincima koji su svojim angažovanjem doprinijeli da Konferencija DEMI 2013 bude uspješno organizovana.

U Banjoj Luci, maj 2013. godine
Predsjednik Organizacionog odbora
Konferencije DEMI 2013
Valentina Golubović-Bugarski



STABILITY ANALYSIS OF DISC BRAKE MODEL: A PARAMETRIC STUDY

Jasna Glišović¹, Jovanka Lukić², Danijela Miloradović³

Summary: *Automobile disc brakes were intensively developed over recent decades, but at the same time the engine power, average vehicle speed, and hence the kinetic energy to be transformed into the brake, were significantly increased, too. A small part of the kinetic energy is transformed into sound energy and creates noise. Disc brake noise is a problem that has preoccupied manufacturers. User's complaints lead to significant annual warranty costs. More importantly, user dissatisfaction can lead to losses in future business operations. The squealing brake is difficult and expensive to repair. It is better to solve the noise problem during design phase. In this manner, good understanding of the brake noise mechanism has become an important factor in the competition in the construction of successful braking systems. This paper presents a disc brake model using the finite element method for the numerical study of the squeal phenomenon and is verified by experimental measurements. The effect of the main operational parameters (braking pressure and friction coefficient) on the squeal propensity is performed.*

Keywords: *disc brakes, squeal, stability analysis, parametric analysis*

1. INTRODUCTION

The finite element method is often used for modeling of the disc brakes to prevent the generation of brake squeal noise through structural modifications, but the priority is to get more realistic and accurate results in the predicting of these phenomena. The most commonly used methods for simulation and analysis, and for prediction of the brake squeal are: the complex eigenvalues analysis in the frequency domain and transient dynamic analysis in the time domain.

Complex eigenvalues analysis is a method that has the advantage among researchers because it is longer used than the transient dynamic analysis. Furthermore, the complex eigenvalues analysis can provides a much faster solution

¹ Ph.D Jasna Glišović, assistant professor, Serbia, University of Kragujevac, Faculty of Engineering, jaca@kg.ac.rs

² Ph.D Jovanka Lukić, full professor, Serbia, University of Kragujevac, Faculty of Engineering, lukicj@kg.ac.rs

³ Ph.D Danijela Miloradović, assistant professor, Serbia, University of Kragujevac, Faculty of Engineering, nej@kg.ac.rs

